Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

	)	
In re	)	
	)	**NO. 14-CRB-0011-SD (2010-13)**
DISTRIBUTION OF SATELLITE	)	
ROYALTY FUNDS	)	
	)	

WRITTEN REBUTTAL STATEMENT
OF THE JOINT SPORTS CLAIMANTS

Volume I of III

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OF THE JOINT SPORTS CLAIMANTS**

Pursuant to Section 351.11 of the rules of the Copyright Royalty Judges ("Judges"), 37 C.F.R. § 351.11, and the Judges' order in this proceeding dated November 2, 2018, the Joint Sports Claimants[1] ("JSC") hereby submit the following written rebuttal statement:

- **Volume I** contains the written rebuttal testimony of JSC's eight witnesses.

- **Volume II** contains the written testimony from prior cable royalty distribution proceedings that the JSC witnesses discuss in their written rebuttal testimony and cite as JSC Exhibit Nos. 8-29.

- **Volume III** contains the transcripts of the oral direct, cross and redirect examination pertaining to the written testimony in Volume II.

JSC hereby designate the testimony in Volumes II-III for inclusion in their written rebuttal statement pursuant to 37 C.F.R. §§ 351.11 & 351.4(b)(2). This memorandum summarizes the written rebuttal testimony in Volume I.

OVERVIEW OF JSC'S WRITTEN REBUTTAL STATEMENT

The purpose of this proceeding is to allocate among the JSC, Program Suppliers, Settling Devotional Claimants ("SDC"), and Broadcaster Claimants Group (the "Allocation Phase

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[1] The Joint Sports Claimants are the Office of the Commissioner of Baseball, National Football League, National Hockey League, National Basketball Association, Women's National Basketball Association, and the National Collegiate Athletic Association.

Parties") the royalties that satellite carriers paid to retransmit broadcast television programming

during the 2010-13 period pursuant to the compulsory copyright license for satellite carriers, 17

U.S.C. § 119. *See*, *e.g., Notice of Participant Groups, Commencement of Voluntary Negotiation*

Period (Allocation), and Scheduling Order, No. 14-CRB-0011-SD (2010-13) (Nov. 25, 2015).

While there is no express statutory standard for allocating Section 119 royalties, the Judges and

their predecessors have applied a "relative marketplace value" standard in proceedings to allocate

royalties paid pursuant to the compulsory license for cable systems, 17 U.S.C. § 111, as well as in

Phase II satellite proceedings. *See e.g.*, *Distribution of Cable Royalty Funds*, 84 Fed. Reg. 3552,

3555 (Feb. 12, 2019) ("2010-13 Cable Final Determination"); *Final Determination of Royalty*

Distribution, No. 2012-6 CRB CD 2004-09 (Phase II) and No. 2012-7 CRB SD 1999-2009 (Phase

II), at 5 (Feb. 13, 2019). The D.C. Circuit has noted its approval of the use of "relative market

value" as the "key criterion for allocating awards" in the Section 111 context. *Program Suppliers*

v. Librarian of Congress, 409 F.3d 395, 401-02 (D.C. Cir. 2005).

No party to this proceeding suggests an alternative to the "relative marketplace value"

standard that the Judges have adopted in cable royalty proceedings. In fact, several witnesses

discuss the application of the standard to the satellite royalty funds in their written direct testimony.

See Written Direct Testimony of Jane V. Saunders, Docket No. 14-CRB-0011-SD (2010-13)

(Mar. 22, 2019), at 6 ("I understand that the standard for allocation of royalties in this proceeding

is the relative marketplace value of program categories in a hypothetical market"); Written Direct

Testimony of Dr. William J. Brown, Docket No. 14-CRB-0011-SD (2010-13) (Mar. 22, 2019),

at 26 ("I continue to support the Bortz Survey and other similar surveys as the most appropriate

tools for determining the relative marketplace value of program genres.").

The Judges recently applied this "relative marketplace value" standard to distribute the 2010-13 Section 111 royalty funds. 2010-13 Cable Final Determination at 3555. As JSC's witnesses explained in their written direct testimony, the Judges' royalty allocations in that proceeding should apply as a benchmark for allocating the 2010-13 satellite royalties. In rebuttal, JSC witnesses Trautman, Dick, Hartman and Shull explain how the testimony of other parties' experts[2] supports the view that cable systems and satellite carriers compete with one another in the same market for subscribers, and therefore value programming in the same manner. These experts' testimony confirms that the Judges' 2010-13 cable royalty allocation satisfies the Judges' four-part test for employing it as a benchmark in this proceeding. For example, Dr. Erdem (SDC) concluded as follows:

> CSOs and SOs [satellite operators] compete in the same market—
> the market for MVPD programming. They offer similar
> programming and compete for the same customers. As a result, I
> conclude that the decision-making process to determine relative
> valuations for cable and satellite is essentially the same. That is,
> there is no reason to believe and no evidence to suggest that SOs
> value programming differently than CSOs to any noticeable degree
> based on the available data, and there is strong reason to expect that
> SOs and CSOs value programming similarly, as would be expected
> of direct competitors in the same market.

Erdem AWDT at ¶ 34.

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[2] *See* Corrected Written Direct Testimony of Howard B. Homonoff, No. 14-CRB-0011-SD (2010-13) (June 7, 2019) at ¶¶ 15-18, 29; Amended Written Direct Testimony of Jeffrey S. Gray, Ph.D., No. 14-CRB-0011-SD (2010-13) (June 7, 2019) at ¶ 13; Amended Written Direct Testimony of Erkan Erdem, Ph.D, No. 14-CRB-0011-SD (2010-13) (June 7, 2019) at ¶¶ 28, 30, 34 ("Erdem AWDT"); Amended Written Direct Testimony of Professor Daniel L. Rubinfeld, No. 14-CRB-0011-SD (2010-13) (June 7, 2019) at ¶¶ 12, 45, 51, 107-08; Written Direct Testimony of Dr. William J. Brown, No. 14-CRB-0011-SD (2010-13) (Mar. 22, 2019) at 5, 27; Amended Written Direct Testimony of John S. Sanders, No. 14-CRB-0011-SD (2010-13) (June 7, 2019) at ¶ 10-12, 14; Written Direct Testimony of Toby Berlin, No. 14-CRB-0011-SD (2010-13), (Mar. 22, 2019) at 11-12; Corrected Written Direct Testimony of Randal D. Heeb, No. 14-CRB-0011-SD (2010-13) (June 7, 2019) at ¶¶ 14-15.

JSC REBUTTAL WITNESSES

Andrew Dick, Ph.D. Dr. Andrew Dick is an economist at Charles River Associates ("CRA"), an economics consulting firm, where he holds the position of Vice President of the Competition Practice. He received a Ph.D. and M.A. in Economics from the University of Chicago and a B.A. in economics and political science from the University of Toronto. Dr. Dick previously worked in the Antitrust Division of the U.S. Department of Justice and has substantial experience with cable systems and satellite carriers, various forms of media, and with regard to professional and collegiate sports. In his written direct testimony, Dr. Dick explained that the application of the 2010-13 Cable Final Determination as a benchmark satisfies the Judges' four-part benchmarking standard. He testified that the economic principles embodied in the Judges 2010-13 Cable Final Determination apply equally to cable and satellite retransmissions of broadcast signals, and it is appropriate to rely upon that decision to allocate the 2010-13 Section 119 royalties.

Dr. Dick's rebuttal testimony addresses several topics. *First*, he addresses Dr. Gray's measures of viewing and volume, and explains that both methodologies are essentially identical to those that the Judges rejected in the 2010-13 cable proceeding. Dr. Dick explains that neither viewing nor volume is an economically valid measure of relative market value, and that Dr. Gray's "viewing" study does not account for the premium that satellite carriers pay to carry JSC programming. *Second*, Dr. Dick's testimony responds to Mr. Homonoff's cable network analysis, and explains that the volume metrics Mr. Homonoff presented do not provide a valid economic basis for determining relative marketplace value. *Third*, Dr. Dick testifies that the satellite fees-based regressions attempted by Dr. Gray and Dr. Erdem (which neither endorses as a means of allocating Section 119 royalties) fail to produce reliable or valid estimates of economic value. He explains that those regressions simply confirm that it is not possible to perform a reliable fee-based

regression using satellite data, given limitations in the satellite data that are not present in cable data. *Fourth*, Dr. Dick responds to SDC witnesses' criticisms of the fees-based regression analysis that Dr. Crawford presented in the 2010-13 cable proceeding, and he explains that these witnesses' critiques repeat arguments that the Judges rejected in that proceeding.

James M. Trautman. Mr. Trautman, Managing Director of Bortz Media & Sports Group, is an expert in market research, including survey research and valuation in the cable, broadcast and television programming industries. He previously submitted written direct testimony in this proceeding regarding the application of the 2010-13 Cable Final Determination as a benchmark for the allocation of the 2010-13 satellite royalty funds. Mr. Trautman explained that cable and satellite MVPDs value programming similarly, and that the programming carried under the Section 111 and 119 licenses was similar during 2010-13. In particular, both cable operators and satellite carriers paid a significant majority of their compulsory licensing royalties in the 2010-13 period for the right to retransmit WGNA.

In rebuttal, Mr. Trautman's testimony addresses Dr. Gray's viewing study and Mr. Homonoff's volume metrics. Mr. Trautman's testimony presents quantitative data demonstrating that MVPDs pay disproportionately more to carry JSC programming than its relative share of program viewership or volume would otherwise suggest. Mr. Trautman additionally testifies that if, as SDC's witnesses urge, the Judges rely upon cable system operator surveys to allocate Section 119 royalty payments, they should rely upon the Bortz surveys and not the Horowitz surveys.

Daniel M. Hartman. Mr. Hartman spent fifteen years as a programming executive at DirecTV. From 2007 through 2013, he was Senior Vice President of Programming Acquisitions. His responsibilities included negotiating for the right to carry WGNA, as well various sports channels and other program networks. He previously submitted written testimony in this

proceeding explaining that DirecTV, as the largest payer of Section 119 royalties during the 2010-13 period, placed primary importance on carrying live team sports telecasts. As Mr. Hartman explained, DirecTV elected to carry WGNA because of its live team sports telecasts. Live team sports programming is particularly important for competing for pay television subscribers. DirecTV placed a far greater value on the JSC programming than on other types of programming, including Program Suppliers' infomercials, reruns of sitcoms, and movies, as well as Devotional programming. Mr. Hartman's written rebuttal testimony responds to testimony from other witnesses regarding the value of WGNA; the relationship between the value of programming and its relative shares of volume and viewership; and the value of "niche" programming, including religious programming in the Devotional category. As Mr. Hartman explains, DirecTV paid the bulk of its Section 119 royalties to carry the live sports broadcasts on WGNA. Furthermore, neither relative viewing nor volume equals relative marketplace value; satellite carriers pay substantially more for JSC programming than would be indicated by its viewing or volume. Finally, satellite carriers do not and did not accord the Devotional programming on WGNA or other Section 119 signals any premium because that programming supposedly appeals to a relatively small "niche" audience.

David Shull. From 2008 to 2014, Mr. Shull served as Senior Vice President, Programming, at Dish Network LLC ("Dish"). In this role, Mr. Shull was responsible for the acquisition of content, negotiation of content pricing, and determination of the line-up and packaging of channels provided to Dish subscribers. Mr. Shull was also responsible for reviewing Dish's copyright payments made pursuant to the Section 119 compulsory license. In his written direct testimony, Mr. Shull testified that cable and satellite MVPDs competed directly for subscribers, and as a result valued television programming in a very similar manner. Like cable

operators, satellite carriers valued live team sports programming more highly than any other category of programming because it is critical for attracting and retaining subscribers. Mr. Shull also explained that Dish spent the vast bulk of its Section 119 royalty payments to carry WGNA because of the Cubs, Bulls and White Sox telecasts aired on that channel.

In his rebuttal testimony, Mr. Shull responds to Program Supplier witnesses Dr. Jeffrey S. Gray and Howard Homonoff and SDC witnesses Dr. William J. Brown, Dr. John S. Sanders and Toby Berlin. Mr. Shull's testimony explains that Dish chose to pay a majority of its Section 119 royalty payments for carriage of WGNA because of the valuable live team sports programming on the signal. He explains that, in making channel carriage decisions, he considered numerous factors—including the strength of subscriber interest in the programming on the channel and its availability on other platforms—that are not captured by measures of viewing or volume alone. Finally, he explains why Dish did not view all categories of "niche" programming as equally valuable, and in particular did not place high value on Devotional content. As Mr. Shull explains, Dish typically did not pay to carry Devotional content but rather was paid by the Devotional content owners to do so.

William E. Wecker, Ph.D. and R. Garrison Harvey. Dr. Wecker is President of William E. Wecker Associates, Inc. ("Wecker Associates"), a statistical and applied mathematical consulting firm. Dr. Wecker holds a Ph.D. in statistics and management science, and he has served as a professor on the faculties of the University of Chicago, the University of California, Davis, and Stanford University, where he taught graduate level statistics and applied mathematics. Mr. Harvey, Vice President and Principal Consultant at Wecker Associates, has a B.S. degree in applied mathematics and a M.S. degree in operations research. Dr. Wecker and Mr. Harvey have extensive expertise in the statistical and mathematical analysis of complex databases used in

litigation. In their direct testimony, Dr. Wecker and Mr. Harvey calculated the application of the 2010-13 Cable Final Determination as benchmark for the Judges' allocation of royalties in this proceeding. Their calculations adjust for the absence of certain copyright claimants (Public Television and Canadian Claimants Group) from satellite allocation proceedings, and also account for differences in the relative volumes of programming of each Agreed Category carried pursuant to the Section 111 and 119 licenses.

In Dr. Wecker and Mr. Harvey's rebuttal testimony, they address the study submitted by Program Suppliers' witness Dr. Gray. Dr. Gray purports to measure the relative "viewing" of distant signal programming purchased by satellite carriers under the Section 119 license, which Dr. Gray equates, without any empirical basis, to market value. Dr. Wecker and Mr. Harvey demonstrate that Dr. Gray's study is based on data that cannot reliably measure distant viewing and that Dr. Gray's regression analysis does not remedy the inadequacies in the data. Among other problems, Dr. Gray bases his study on a data set that (i) lacks distant viewing data for 93.5% of the time periods at issue and (ii) impossibly estimates viewing levels greater than the number of subscribers for tens of thousands of those periods. In addition, Dr. Gray's methodology improperly allocates over 85% of the royalties actually paid by satellite carriers to retransmit the compensable programming on WGNA to programming on other signals. Dr. Wecker and Mr. Harvey further demonstrate the unreliability of Dr. Gray's study by comparing its results to various datapoints. Dr. Wecker and Mr. Harvey also explain that there is nothing "enhanced" about Dr. Gray's methodology—it is nearly identical to the methodology used in the 2010-13 cable proceeding— and the methodology measures nothing other than viewing.

Brad Adgate. Mr. Adgate, an expert in media research, has spent approximately four decades advising businesses on the practical use of Nielsen viewing data. Prior to his work as an

independent consultant, Mr. Adgate was Senior Director, Media Insights at Comcast (2015-17) and Senior Vice President of Research at Horizon Media (1998-2015). Mr. Adgate has served on Nielsen's Local Policy Guidelines Committee, the Media Research Council, and the Council for Research Excellence. Mr. Adgate's rebuttal testimony explains that the data Dr. Gray takes from Nielsen's National People Meter ("NPM") survey cannot be used to measure viewership of programming on signals carried under the Section 119 compulsory license. As he explains, the NPM is designed to measure viewership to nationally-distributed programming, and, with the exception of WGNA, no Section 119 signal is nationally distributed. Mr. Adgate explains that the improper attempt to use NPM data (including NPM weights designed to project national viewing) to estimate non-national viewing results in inadequate input data and produces unreliable estimates.

Nancy A. Mathiowetz, Ph.D. Dr. Mathiowetz is an expert in survey research methodology. She is a Professor Emerita, Department of Sociology, at the University of Wisconsin-Milwaukee; she also has served as an Associate Professor, Joint Program in Survey Methodology, at the University of Maryland and University of Michigan; and she has frequently testified as to whether survey evidence meets the standards for admissibility under the Federal Rules of Evidence. Dr. Mathiowetz's rebuttal testimony explains that if the Judges rely on cable operator surveys in allocating satellite royalties, they should rely on the Bortz surveys and not the Horowitz surveys. The Horowitz surveys have multiple problems that render them unreliable and that were not addressed in the 2010-13 Final Cable Determination.

SUMMARY OF REBUTTAL TESTIMONY

A. Rebuttal to Program Suppliers

Program Suppliers request an allocation of royalties based on a "viewing" study submitted by Dr. Jeffrey Gray (the "Gray Study"). This study is conceptually and methodologically flawed, and cannot provide a proper basis for the allocation of the 2010-13 satellite royalty funds.

1. The Gray Study

Viewing. JSC's witnesses testify that (i) viewership is not a valid measure of relative market value and (ii) Dr. Gray's "viewing" study is nearly identical to the viewing study the Judges rejected in their 2010-13 Cable Final Determination. The Gray Study remains conceptually and methodologically flawed, and cannot produce valid or reliable measures of viewership, much less relative marketplace value, for the following reasons:

First, as the Judges correctly recognized in their 2010-13 Cable Final Determination, viewing does not equal value, and Dr. Gray's analysis therefore could not provide a reliable measure of relative market value even if it accurately estimated viewing (which it does not, as explained below). As JSC witnesses testify, the Gray Study treats all hours of viewing as equally valuable and is therefore inconsistent with the economics of the cable and satellite television industry. JSC witnesses further explain how industry data demonstrate that viewing levels do not account for the premiums that MVPDs pay for different types of programming.

Second, while Dr. Gray claims that his study is "enhanced," JSC witnesses Dr. Wecker, Mr. Harvey, and Dr. Dick explain that the Gray Study merely repackages the same methodology used in Dr. Gray's 2010-13 cable testimony. The primary methodological change is that Dr. Gray's new regression analysis simply omits the independent variable for "local ratings."

Third, the Gray Study relies on NPM data that cannot be used to measure viewership to nearly all Section 119 signals. Mr. Adgate explains that Dr. Gray cannot rely upon NPM data to

measure viewership of programming that is not nationally distributed. JSC witnesses Dr. Wecker and Mr. Harvey demonstrate that the NPM data used by Dr. Gray are fundamentally inadequate to measure viewership to non-WGNA Section 119 signals (Dr. Gray lacks NPM data for 93.5% of the records in his study). Moreover, Dr. Gray uses improperly weighted NPM data, which frequently estimate levels of viewership that are implausibly high (estimating, for instance, levels of viewing of infomercials that exceed viewing of the Super Bowl) or impossibly high (estimated viewing that exceeds a station's distant subscribers).

Fourth, Dr. Gray's regression methodology is incapable of remedying any of the data issues in the NPM "custom analysis." JSC witnesses Dr. Wecker and Mr. Harvey explain that regression analyses are not designed to remedy flaws in data, and that the Gray regression merely mirrors back the same viewership measurements that Dr. Gray takes as inputs from the "custom analysis" of NPM data. Indeed, there is no significant difference between the viewing shares produced by Dr. Gray's "enhanced" viewing study and those produced by the use of the raw data alone.

Finally, JSC's rebuttal testimony demonstrates that Dr. Gray's study generates highly implausible results. For example, Dr. Gray's study purports to assign just 13.1% of the overall 2010-13 satellite royalty funds to programming carried on WGNA, notwithstanding that satellite carriers paid more than 73% of their Section 119 royalty payments to retransmit WGNA, as depicted in the graph below. Likewise, for every non-WGNA Section 119 signal, Dr. Gray's study allocates more value to the *Program Supplier programming on the signal alone* than satellite carriers actually paid to retransmit the entire signal under Section 119.
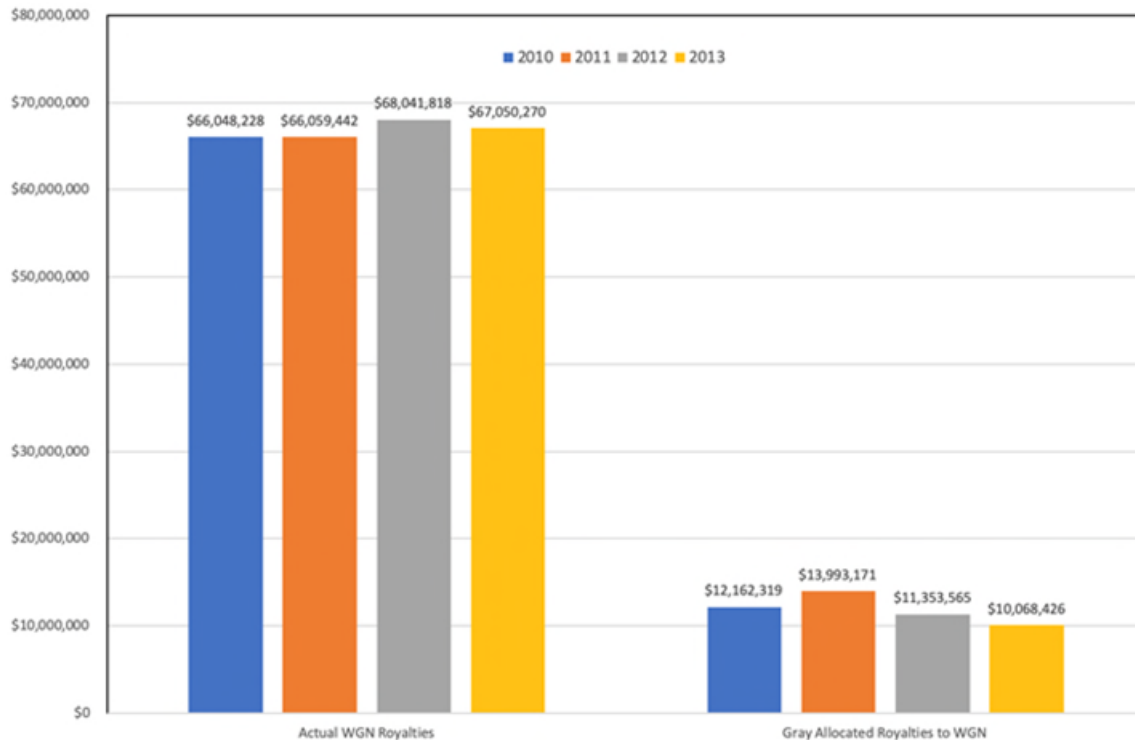
Fee-based regressions. Dr. Gray presents two fee-based regression models but does not recommend that the Judges use either to allocate royalties. Dr. Gray admits that neither of his fee-based regression models produce statistically significant results to a 90% confidence interval for any Agreed Category other than Program Suppliers. JSC witnesses explain that neither model produces statistically significant results to a 95% confidence interval for any Agreed Category. As the JSC witnesses explain, such statistically insignificant results cannot be used to determine relative marketplace value.

JSC witness Dr. Dick further explains that the failure to produce statistically-significant results is driven by data limitations specific to the Section 119 context. Because there are far fewer satellite carriers than cable operators, and because satellite carriers do not divide their royalty payments by subscriber group, there are far fewer observations to use as inputs to a regression analysis.

2.   Homonoff Analysis

Mr. Homonoff's analysis of cable network data confirms that neither viewing nor volume is a valid measure of value. Moreover, Mr. Homonoff's analysis understates the value of JSC programming. JSC witnesses explain that Mr. Homonoff's volume metrics are not a reliable measure of value, as volume alone does not equal value in the MVPD marketplace. Mr. Homonoff's own data on network affiliate fees demonstrates that the license fees MVPDs pay do not correlate to volume or viewing. Moreover, Mr. Homonoff's analysis illustrates that undifferentiated, readily available Program Suppliers' content is widely available and does not command a high relative market value.

Additionally, when Mr. Homonoff's analysis of affiliate fees is corrected to adjust for omissions, it demonstrates that, during 2010-13, MVPDs spent approximately 41% of their affiliate fees on sports networks. That share is consistent with the shares allocated by the Judges to JSC in the 2010-13 Cable Final Determination, adjusted for satellite volumes.

B. Rebuttal to the Settling Devotional Claimants

SDC argues that the Judges should rely on the 2010-13 cable operator surveys to allocate the Section 119 royalties. JSC witnesses testify that properly designed and executed CSO surveys do provide strong evidence of relative marketplace value. However, because the Judges have already made a determination regarding the relative marketplace value of distant signal programming in the 2010-13 cable proceeding (which incorporated survey evidence), the Judges should use that final determination as the benchmark in this proceeding for establishing relative marketplace value. Furthermore, unlike Dr. Dick's benchmark analysis, SDC has made no attempt to account for the fact that, in 2010-13, satellite carriers retransmitted a much smaller proportion of Devotional programming than did the cable operators surveyed by Bortz and Horowitz.

JSC's rebuttal witnesses testify that if the Judges decide to rely on cable operator survey evidence instead of their cable final determination, then the Judges should rely upon the Bortz survey results and not the Horowitz survey results. While the Judges' 2010-13 Cable Final Determination accorded less weight to Bortz than Horowitz, the Judges' primary concern with the Bortz surveys, potential undervaluation of Public Television and Canadian programming, is simply not an issue in this proceeding. Public Television and Canadian programming are not carried under Section 119 and therefore are not part of the satellite royalty allocation. Moreover, the Horowitz surveys contain fundamental flaws that remain relevant in this proceeding, including (i) the use of incorrect and misleading program examples in identifying Program Suppliers' programming; (ii) failing to identify compensable programming for systems that carried WGNA as their only distant signal; and (iii) a data collection approach that resulted in a significant burden on the respondents and a high concentration of responses attributable to a small number of individual respondents.[3]

JSC witnesses also address SDC witnesses' testimony on the use of fee-based regression analyses to allocate the Section 111 and 119 royalty funds. JSC witness Dr. Dick explains that SDC witnesses Dr. Rubinfeld and Dr. Erdem repeat critiques of the Crawford cable regression analysis that the Judges rejected in the 2010-13 Cable Final Determination. Additionally, as with Dr. Gray's attempted regression of satellite fees, Dr. Erdem's regression of satellite fees (which he does not suggest should be used to allocate satellite royalties) demonstrates that fee-based regressions cannot be estimated using satellite data. As Dr. Dick further explains, this does not imply that the royalty allocation in the 2010-13 Cable Final Determination is an inappropriate benchmark to use in the current proceeding, as appropriate data were available to perform a

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[3] The Horowitz survey's addition of an "Other Sports" category was also a fundamental flaw. The Judges properly recognized that the "Other Sports" category "created" value where none existed and they reallocated the "Other Sports" category to Horowitz's remaining program categories. 2010-13 Cable Final Determination at 3591.

regression in the cable proceeding and that regression found corroboration in other record evidence. The unavailability of appropriate satellite data to perform a fee-based regression reaffirms why the benchmark approach Dr. Dick described in his direct testimony provides the most reliable methodology for assigning relative market value in the satellite proceeding.

Finally, JSC witnesses Hartman and Shull address SDC's claims that its programming is particularly valuable because it appeals to a specific subscriber niche and entitled to a premium (as in the cable proceeding). As programming executives at the two major satellite carriers during the 2010-13 period, neither Mr. Hartman nor Mr. Shull placed high value on carrying Devotional programming. In fact, they typically carried such programming for free, or were even paid to do so. Neither chose to carry any Section 119 signal because of the Devotional programming that it offered.

CONCLUSION

The testimony submitted by the other parties does not refute the evidence JSC submitted in its written direct statement in support of applying the 2010-13 Cable Final Determination as a benchmark for distributing the 2010-13 satellite royalty funds. Indeed, experts for all the claimant groups agree that cable and satellite MVPDs competed directly with one another and valued programming similarly, providing further support for applying the Judges' 2010-13 Cable Final Determination to the 2010-13 satellite royalty funds. Accordingly, the Judges should award JSC no less than the 2010-13 satellite royalty shares JSC requested in their June 7, 2019 Amended Written Direct Statement.

Respectfully submitted,

JOINT SPORTS CLAIMANTS

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CERTIFICATE OF SERVICE

I hereby certify that on this 26th day of August, 2019, a copy of the foregoing Written Rebuttal Statement of the Joint Sports Claimants was filed electronically using eCRB, which will automatically provide electronic service copies to all counsel of record who are registered to use eCRB. *See* 37 C.F.R. § 350.6(h)(1).

        /s/ Michael Kientzle
        Michael Kientzle

Before the

COPYRIGHT ROYALTY JUDGES

Washington, DC.

In re :	NO. 14-CRB-0011-SD (2010-13)
DISTRIBUTION OF **SATELLITE ROYALTY FUNDS**	

WRITTEN REBUTTAL TESTIMONY OF

ANDREW R. DICK, Ph.D.

August 26, 2019

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I.   QUALIFICATIONS

1.   My name is Dr. Andrew Dick. I am an economist at Charles River Associates ("CRA"), an economics consulting firm, where I hold the position of Vice President in the Competition Practice. My business address is 1201 F Street, N.W., Washington, D.C. 20004. I received a Ph.D. and M.A. in Economics from the University of Chicago and a B.A. in Economics and Political Science from the University of Toronto. By training and experience, I am a specialist in competition economics, which involves the application of economic principles and methods to address questions about the structure and operation of markets.

2.   My professional experience spans more than 25 years, the majority of which has involved analyzing competition issues. Prior to joining CRA in 2003, I was employed by the Antitrust Division of the U.S. Department of Justice ("DOJ") for seven years where I held positions as Staff Economist and later Assistant Chief and then Acting Chief of the Competition Policy Section. While at the DOJ, I managed a large staff of Ph.D. economists working on competition assignments, including investigations involving the broadcast, cable and satellite television industry and other media sectors. Previously, I was an Assistant Professor of Economics at the University of California, Los Angeles from 1989 to 1996 where I taught courses on microeconomics, competition, and antitrust and regulation policy. My research has focused on competition economics, including in regulated industries where prices are not set freely in the marketplace. I have published widely in peer-reviewed academic and practitioner journals on competition, market and monopoly power, the competitive effects and rationale of business policies and practices, and other issues relevant to competition economics. I have also made numerous invited presentations on competition topics to governmental and academic institutions.

3.   As an economist at the DOJ and in private practice, I have evaluated competition issues in a broad variety of industries, including industries closely related to the subject of the current proceeding. Of particular relevance, I have analyzed competition in licensing cable and satellite networks to multi-channel video programming distributors (MVPDs) and competition issues involving cable, satellite, and online streaming distribution of live

team sports programming. I described my background and qualifications more fully in my Written Direct Testimony.[1]

II. INTRODUCTION AND SUMMARY

4. Based on my analysis of written direct testimony from other parties in this proceeding, I have reached the following main opinions:

a. *Further support for my benchmark analysis*. Testimony from economic and industry experts retained by other parties in this proceeding reinforces key conclusions from the benchmark analysis I presented in my Written Direct Testimony. Specifically, testimony from economic and industry experts submitted on behalf of Program Suppliers (Dr. Jeffrey S. Gray and Howard B. Homonoff), Settling Devotional Claimants (Toby Berlin, Dr. William J. Brown, Dr. Erkan Erdem, Professor Daniel L. Rubinfeld and John S. Sanders), and Commercial Television Claimants (Dr. Randal D. Heeb) supports the conclusion that cable system operators (CSOs) and satellite carriers are direct economic competitors with similar business models who value programming similarly. That testimony therefore reinforces my opinion that, as a matter of economics, it is appropriate to use the Judges' royalty allocation from the 2010-13 Cable Proceeding as a benchmark for allocating royalties in the current satellite royalty proceeding.

b. *Gray's viewing analysis and volume measures.* The Program Suppliers' economic expert (Dr. Gray) offers an analysis of hours of programming by category (his "volume measure") as well as an analysis of what he describes as "enhanced viewing." Dr. Gray opines that his viewing measure is the best measure of relative market value in this proceeding. However, both of these analyses are nearly identical to the analyses he presented in the 2010-13 Cable Proceeding, which the Judges rejected. As was the case in the

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[1] Written Direct Testimony of Andrew R. Dick, Ph.D., *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (corrected June 7, 2019) (hereinafter "Dick 2010-13 Satellite WDT").

2010-13 Cable Proceeding, Dr. Gray's analyses lack a sound economic basis and are controverted by the facts.

c. *Homonoff's cable network analyses.* The analyses offered by Program Suppliers' industry expert (Mr. Homonoff) are limited to volume measures and do not provide a valid economic basis for determining relative value. Furthermore, Mr. Homonoff's own data on network affiliate fees show that subscribership volume does not equate to value: there is no systematic relationship between network affiliate fees and total subscribers, and many of the most widely carried networks have lower affiliate fees than less-widely carried networks.

d. *Fee-based regressions.* While the Judges recognized in their 2010-13 Final Cable Determination that the fee-based regression presented by Commercial Television Claimants' economic expert Dr. Gregory Crawford provided useful information on the relative market value of programming in cable,[2] it is not possible to perform a reliable fee-based regression using satellite data. Dr. Gray acknowledges these limitations. He nonetheless proffers an attempted fee-based regression using satellite data, and his analysis confirms that data limitations prevent reliable estimation of a fee-based regression model using satellite data. Dr. Erdem's attempt at a regression using satellite data is similarly problematic.[3] This does *not* imply, however, that the royalty allocation in the 2010-13 Final Cable Determination is not an appropriate benchmark to use in the current proceeding, as appropriate data were available to perform a regression in the Cable Proceeding. Rather, the unavailability of appropriate satellite data

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[2] Final Determination of Royalty Allocation, Docket No. CONSOLIDATED 14-CRB-0010-CD (2010-2013), 84 FR 3552-3611 (hereinafter "2010-13 Final Cable Determination") at 3610.

[3] While Drs. Gray and Erdem each presented a fee-based regression using satellite data, neither of them advocated relying on those regressions in determining the relative value of programming in this proceeding. Written Direct Testimony of Erkan Erdem, Ph.D., *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (amended June 7, 2019) (hereinafter "Erdem 2010-13 Satellite WDT") at ¶7; Written Direct Testimony of Jeffrey S. Gray, Ph.D., *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (amended June 7, 2019) (hereinafter "Gray 2010-13 Satellite WDT") at ¶¶75-76.

to perform a fee-based regression reaffirms why the benchmark approach I described in my direct testimony provides the most reliable methodology for assigning relative market value in the satellite proceeding.

e. *Crawford cable regression analysis.* In the current satellite proceeding, economic experts for the Settling Devotional Claimants reprise critiques of what they claim to be flaws in the Crawford cable regression approach. These critiques largely repeat arguments that the Judges considered in the 2010-13 Cable Proceeding. After considering those critiques, the Judges in that proceeding concluded that Professor Crawford's regression analysis was, "on balance … highly useful in estimating relative values in this proceeding." [4] The relevance of the critiques raised by the Settling Devotional Claimants' experts is further undermined by the Judges' determination that the results from Professor Crawford's cable regression are consistent with other evidence that the Judges considered and adopted in the Cable Proceeding.

III. OTHER PARTIES' EXPERTS AGREE WITH KEY CONCLUSIONS IN MY BENCHMARK ANALYSIS

5. In my Written Direct Testimony, I explained that CSOs and satellite carriers share highly similar (i) economic roles, (ii) product offerings, (iii) business models, and (iv) demand and cost drivers.[5] These indicia allow economists to assess whether two entities—in this instance, CSOs and satellite carriers—are direct competitors. Because CSOs and satellite carriers share each of these economic indicia as direct competitors, economic analysis indicates that they will value programming similarly. Moreover, I described how the royalty allocation from the 2010-13 Cable Proceeding satisfies the four-part benchmarking test articulated by the Judges. Specifically, I concluded that: [1] the relevant parties in the cable and satellite royalty allocation proceedings are economically

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[4] 2010-13 Final Cable Determination at 3569.

[5] *See* Dick 2010-13 Satellite WDT, §III.C.1.

comparable;[6] [2] the rights being valued in the two proceedings are economically comparable;[7] [3] CSOs and satellite carriers face highly similar economic circumstances in large measure because they are direct competitors to one another;[8] and [4] the rights valuation methodology is predicated on there being an adequate degree of competition to assign relative values to different program categories.[9]

6.   My testimony explained that CSOs and satellite carriers perform the same basic economic function. While the physical equipment used in cable distribution and satellite distribution is different, both technologies enable carriers to provide households and non-residential customers with the ability to view secondary transmissions of out-of-market distant broadcast signals along with other programming. CSOs and satellite carriers both rely on similar rights granted in Sections 111 and 119 of the Copyright Act, respectively, to provide these secondary transmissions to their subscribers.[10]

7.   Furthermore, I observed that CSOs and satellite carriers offer directly comparable products to prospective subscribers. Both types of carriers offer a menu of programming options (e.g., packages or service tiers) that are chosen to appeal to prospective subscribers. Programming executives for CSOs and satellite carriers expend significant time and energy in selecting their programming mix so as to make their products as strong a competitor in the marketplace as possible. Distant signal programming retransmitted via satellite had a similar composition as distant signal programming retransmitted via cable during the relevant time period of this proceeding, and CSOs and satellite carriers were roughly comparable in terms of their relative volumes of programming in each of the four categories covered in this proceeding.[11]

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[6] *See* Dick 2010-13 Satellite WDT, §III.C.1.

[7] *See* Dick 2010-13 Satellite WDT, §III.C.2.

[8] *See* Dick 2010-13 Satellite WDT, §III.C.3.

[9] *See* Dick 2010-13 Satellite WDT, §III.C.4.

[10] Dick 2010-13 Satellite WDT at ¶47.

[11] Indeed, WGNA was the most widely-carried distant signal by both CSOs and satellite carriers during the time period covered by this proceeding. WGNA accounted for 73 percent of the total distant signal subscriber instances under Section 111 and 72 percent of the total distant subscriber instances under Section 119. In each year during 2010-13, distant signals that were carried under both Sections 111 and 119 accounted for

8.   My testimony also found that the business models of CSOs and satellite carriers are highly similar. Both types of firms compete for subscribers by offering bundles of programming for monthly subscriber fees, and such fees account for the vast majority of revenue from video offerings for both types of companies. Neither CSOs nor satellite carriers are permitted to insert or sell advertising on distant signals carried pursuant to Section 111 or 119 licenses, respectively. This means that CSOs and satellite carriers value distant signals exclusively for the purpose of maintaining and expanding their subscriber bases.[12]

9.   Finally, my analysis concluded that the same principal economic factors drive CSOs' and satellite carriers' demand for and cost of programming. I cited testimony from former senior executives of a major CSO (Comcast) and a major satellite carrier (DirecTV) explaining that customer acquisition and retention goals drive program acquisition decisions. Because CSOs and satellite carriers compete directly for customers, this leads them to face highly similar demand pressures and value programming similarly. Both types of carriers also face strongly correlated cost pressures. In my earlier testimony, I observed that the two largest satellite carriers, DISH Network ("DISH") and DirecTV, used most favored nations clauses ("MFNs") that were tied to carriage prices for large MVPDs, including cable operators. The use of MFNs meant that programming cost changes experienced by CSOs would be directly felt by competing satellite carriers.[13]

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between 95 and 98 percent of the fees generated under Section 119 and between 84 and 88 percent of the fees generated under Section 111. Written Direct Testimony of James M. Trautman *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (corrected June 7, 2019) (hereinafter "Trautman 2010-13 Satellite WDT") at 12-16. *See also* Dick 2010-13 Satellite WDT at ¶¶40-41, 48-49.

[12] Dick 2010-13 Satellite WDT at ¶39.

[13] Written Direct Testimony of John S. Sanders, *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (amended June 7, 2019) (hereinafter "Sanders 2010-13 Satellite WDT") at ¶14; Written Direct Testimony of Daniel M. Hartman *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (corrected June 7, 2019) (hereinafter "Hartman 2010-13 Satellite WDT") at ¶22; Written Direct Testimony of David Shull *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (corrected June 7, 2019) (hereinafter "Shull 2010-13 Satellite WDT") at ¶¶17-18; Written Direct Testimony of Toby Berlin, *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (hereinafter "Berlin 2010-13 Satellite WDT") at 12. *See also* Dick 2010-13 Satellite WDT at ¶¶42-43.

10.   Given the strong comparability between CSOs' and satellite carriers' economic roles, business models, product offerings, and demand and cost drivers, it is unsurprising that a substantial body of evidence shows these two groups of firms are close head-to-head competitors. My previous testimony cited multiple sources of evidence for this conclusion. Former DirecTV and DISH programming executives have testified that CSOs and satellite carriers compete head-to-head using the same types of programming. [14] In securities reports filed contemporaneously within the relevant period in this proceeding, DirecTV and DISH described the competition they face from CSOs as "substantial." [15] Economic studies of the video television industry provide econometric evidence confirming this head-to-head competition. For example, an econometric study found that competition between cable and satellite video service providers led to lower cable subscription prices and higher cable service quality. [16] And a study by Federal Communications Commission economists found that the availability of satellite service acted as a competitive constraint on cable service rates. [17]

11.   Economic and industry experts retained on behalf of other parties to this proceeding agree with my testimony that satellite carriers and CSOs are direct economic competitors with similar business models and value programming similarly. The opinions of these other experts further reinforce my conclusion that the 2010-13 Final Cable Determination is the most reliable benchmark for allocating the 2010-13 satellite royalties. In the

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[14] Shull 2010-13 Satellite WDT at ¶¶16-17, 19; Hartman 2010-13 Satellite WDT at ¶¶7, 20-22; Written Direct Testimony of Daniel M. Hartman *In Re: Distribution of Cable Royalty Funds* (No. 14-CRB-0010-CD (2010-13)), December 22, 2016, JSC Ex. 2 (hereinafter "Hartman 2010-13 Cable WDT") at ¶16.

[15] DirecTV 10-K for the Fiscal Year Ended December 31, 2012 at 9; DISH Network Corporation 10-K for the Fiscal Year Ended December 31, 2012 at 4.

[16] Austan Goolsbee and Amil Petrin, "The Consumer Gains from Direct Broadcast Satellites and the Competition with Cable TV," *Econometrica* 72(2) (March 2004): 351-381 at 377 ("more competition from DBS is correlated with lower cable prices and somewhat higher quality cable").

[17] Andrew S. Wise and Kiran Duwadi, "Competition between Cable Television and Direct Broadcast Satellite: The Importance of Switching Costs and Regional Sports Networks," *Journal of Competition Law and Economics*, 1(4) (December 2005): 679-705 at 701 (the authors' "findings are consistent with the hypothesis that DBS [direct broadcast satellite] providers are a constraining factor on quality-adjusted price increases for basic cable services by cable firms.").

remainder of this section, I explain how testimony submitted by multiple other experts corroborates this conclusion.

A. Settling Devotional Claimants

12.   Settling Devotional Claimants (SDC) offered written expert testimony by economists (Dr. Erkan Erdem and Professor Daniel L. Rubinfeld), a professor in the field of communications and media (Dr. William J. Brown), an appraiser with experience in valuing media and communications assets (Mr. John S. Sanders), and a former DirecTV executive (Ms. Toby Berlin).[18] These experts provided testimony supporting the view that CSOs and satellite carriers are direct competitors who value programming similarly.

13.   Based on his analysis, Dr. Erdem concluded as follows:

> CSOs and SOs [satellite operators] compete in the same market—the market for MVPD programming. They offer similar programming and compete for the same customers. As a result, I conclude that the decision-making process to determine relative valuations for cable and satellite is essentially the same. That is, there is no reason to believe and no evidence to suggest that SOs value programming differently than CSOs to any noticeable degree based on the available data, and there is strong reason to expect that SOs and CSOs value programming similarly, as would be expected of direct competitors in the same market.[19]

14.   Dr. Erdem further explained that:

> CSOs and SOs try to attract the same customers … In most markets, CSOs and SOs compete directly against each other for the same customers. Aside from the differences in the level of competition across geographies, CSOs and SOs have the same business objectives (*i.e.*, attract subscribers), and their valuation of different kinds of programming is expected to be very similar.[20]

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[18] Erdem 2010-13 Satellite WDT; Written Direct Testimony of Professor Daniel L. Rubinfeld, *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (amended June 7, 2019) (hereinafter "Rubinfeld 2010-13 Satellite WDT"); Written Direct Testimony of Dr. William J. Brown, *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (hereinafter "Brown 2010-13 Satellite WDT"); Sanders 2010-13 Satellite WDT; Berlin 2010-13 Satellite WDT.

[19] Erdem 2010-13 Satellite WDT at ¶34.

[20] Erdem 2010-13 Satellite WDT at ¶30. *See also* Erdem 2010-13 Satellite WDT at ¶28.

15.   Professor Rubinfeld offered similar economic testimony on behalf of SDC. Dr. Rubinfeld testified that "cable and satellite compete and are in the same relevant product market" and that "[t]here is no doubt in my view that cable and satellite compete for subscribers in most parts of the country."[21] Professor Rubinfeld also remarked that "[i]n prior antitrust analyses in which I have been involved, I have treated the relevant antitrust markets to include (in most cases) both satellite and cable."[22]

16.   Professor Rubinfeld further opined that "[c]able and satellite are substitutes and are competitive constraints to each other. This competition between cable and satellite has been understood for some time and is well known to the Department of Justice and the Federal Communications Commission, where the relevant market is typically MVPD, multi-channel video programming distribution, and in the industrial organization literature." [23] In support of his conclusion, Professor Rubinfeld cited the Federal Communications Commission's (FCC) 18th Video Competition Report (describing competition among cable, satellite and other providers of video subscription services) as well as academic economic research confirming head-to-head competition between CSOs and satellite carriers.[24] Based on his economic analysis, Professor Rubinfeld concluded that he "expect[ed] cable and satellite [carriers] to value programming with some degree of similarity."[25]

17.   Dr. Brown, a professor in the field of communications and media, began his testimony on behalf of SDC by noting that "the reasons that television viewers subscribe to satellite television services are the same reasons that they subscribe to cable television services."[26] Consistent with this view, Dr. Brown noted that "the large majority of scholars treat cable and satellite services as interchangeable."[27]

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[21] Rubinfeld 2010-13 Satellite WDT at ¶¶12, 51.

[22] Rubinfeld 2010-13 Satellite WDT at n. 45.

[23] Rubinfeld 2010-13 Satellite WDT at ¶107.

[24] Rubinfeld 2010-13 Satellite WDT at ¶107, n. 77 – n. 80.

[25] Rubinfeld 2010-13 Satellite WDT at ¶108.

[26] Brown 2010-13 Satellite WDT at 5.

[27] Brown 2010-13 Satellite WDT at 5.

18.   Dr. Brown opined that CSOs and satellite carriers directly compete for the same subscribers, and this competition drives them to value programming in a highly similar manner:

> Since cable and satellite distributers directly compete for the same viewers and regularly offer financial incentives to convince subscribers to switch from cable to satellite and vice versa, there has been a melding of these viewers into a unified block of non-broadcast viewers. There is no evidence in the academic literature to regard satellite television operators as having a different set of standards of which to evaluate their subscribers as compared to cable television operators. … The same bundling theoretical predictions that apply to cable operators are applied to satellite television operators when considering the willingness of those in each television household to pay for a certain channel or service that carries certain types of programming.[28]

19.   John Sanders, an expert presented by SDC, offered corroborating testimony based on his experience in appraising television programming and other communications and media assets. Mr. Sanders drew an analogy to illustrate the "similarity of satellite MVPDs to cable MVPDs"[29]:

> Much in the same way that the customer of a grocery delivery service will be indifferent to (or unable even to discern) the delivery system (by foot, bicycle, car, or van) as long as the product arrives on time and to acceptable cost and quality standards, an MVPD customer will be indifferent to the delivery system (cable company or satellite company), as long as the product arrives on time and to acceptable cost and quality standards. A subscriber will not immediately be able to discern the delivery system when he or she turns on the television. Consequently, the cable and satellite MVPD companies are grouped together and characterized as a single multichannel industry by operators and investors.[30]

20.   Mr. Sanders further testified that "[b]ecause they operate in the same marketplace, satellite companies and other MVPDs value programming similarly." [31] As further

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[28] Brown 2010-13 Satellite WDT at 27.

[29] Sanders 2010-13 Satellite WDT at ¶10.

[30] Sanders 2010-13 Satellite WDT at ¶¶11-12.

[31] Sanders 2010-13 Satellite WDT at ¶14.

evidence of this point, Mr. Sanders noted that because "both the satellite companies and the broadcast station owners . . . understand that the value of retransmission by satellite is so closely tied to the value of retransmission by cable … the per-subscriber rate for one is used . . . as a contractual benchmark for rates for the other" in retransmission consent agreements between MVPDs and over-the-air television broadcasters.[32]

21.   SDC's expert Toby Berlin, a former DirecTV executive, testified based on her experience:

> [B]y 2010-2013, the cable and satellite industries were direct competitors and the views of operators in identifying the assets that they rely on to obtain and maintain subscribers were very similar. In making a judgment about the relative value of the categories of programming at issue here, it is clear to me that cable and satellite operators think similarly.[33]

B.   Program Suppliers

22.   Program suppliers offered written expert testimony by a former executive at media companies and MVPDs (Howard B. Homonoff) and an economist (Dr. Jeffrey S. Gray).[34] Both experts provided testimony supporting my conclusion that CSOs and satellite carriers are direct competitors who value programming similarly.

23.   Mr. Homonoff testified that "[t]he process by which cable and satellite operators construct their programming line-ups is fundamentally consistent."[35] In particular, satellite carriers and CSOs both "acquire bundles of programming in the form of nationally-distributed cable networks and local broadcast stations."[36] Mr. Homonoff described the

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[32] Sanders 2010-13 Satellite WDT at ¶14.

[33] Berlin 2010-13 Satellite WDT at 11-12.

[34] Written Direct Testimony of Howard B. Homonoff, *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (corrected June 7, 2019) (hereinafter "Homonoff 2010-13 Satellite WDT"); Gray 2010-13 Satellite WDT.

[35] Homonoff 2010-13 Satellite WDT at ¶16. *See also* Homonoff 2010-13 Satellite WDT at ¶14 ("the process by which satellite operators make their programming decisions is not very different from that undertaken by cable operators").

[36] Homonoff 2010-13 Satellite WDT at ¶15.

process whereby corporate programming executives at CSOs and satellite carriers evaluate content offerings from different programmers, including reviewing submitted materials, hearing live pitches, conducting supplemental research, and soliciting input from interested stakeholders.[37]

24.   Mr. Homonoff also testified that CSOs and satellite carriers are direct competitors. He noted that "DISH and DirecTV … competed from their inception with cable operators."[38] Mr. Homonoff further testified that, during the relevant time period for this proceeding, telephone companies such as Verizon and AT&T entered the video marketplace and this led to three-way competition for video subscribers among satellite carriers, CSOs and telephone companies.[39]

25.   Testimony by Program Suppliers' economic expert, Dr. Gray, provides additional support for my conclusion that CSOs and satellite carriers are direct competitors following similar business models. Dr. Gray testified that "[a]s do cable system operators, satellite carriers negotiate and pay fees to cable (*i.e.*, non-broadcast) networks for the right to retransmit the signals to their subscribers. They provide their subscribers access to content carried on these networks for a periodic subscription fee. Households choose from sets of bundled packages of channels offered by competing satellite carriers and cable systems and become subscribing customers."[40]

C.   Commercial Television Claimants

26.   Commercial Television Claimants (CTV) offered Dr. Randal D. Heeb as an economic expert. Dr. Heeb provided testimony that is consistent with my conclusion that CSOs and satellite operators are direct competitors offering similar products and following similar business models. As such, economics indicates that CSOs and satellite operators will have very similar valuations for programming. Dr. Heeb testified in relevant part as follows:

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[37] Homonoff 2010-13 Satellite WDT at ¶¶17-18.

[38] Homonoff 2010-13 Satellite WDT at ¶29.

[39] Homonoff 2010-13 Satellite WDT at ¶29.

[40] Gray 2010-13 Satellite WDT at ¶13.

[T]he cable and satellite markets are similar in key respects. In both cases, system operators contract with owners of channels with various content profiles and assemble menus of channel bundles for subscribers. The profit-maximization problems of cable and satellite system operators lead both to select portfolios of content that maximize the chances of attracting and retaining subscribers. … [C]ompetitive forces tend to equilibrate the relative marginal value of distant signal content in both cable and satellite. In both cases, system operators have an incentive to add content to their offerings up to the point that the overall value of the additional contribution of that content is equal to the cost of the content.[41]

IV. GRAY'S "ENHANCED VIEWING" ANALYSIS AND VOLUME MEASURES REPACKAGE THE SAME METHODOLOGIES THE JUDGES REJECTED IN THE 2010-13 CABLE PROCEEDING AND DO NOT PROVIDE A VALID ECONOMIC BASIS FOR DETERMINING RELATIVE MARKET VALUE

27. In the 2010-13 Cable Proceeding, Dr. Gray presented a study of what he called "viewership" to determine relative market values for distant signal retransmission that is nearly identical to the study he now proffers for allocating satellite royalties. However, the Judges rejected Dr. Gray's study, noting that viewership is an "incomplete measure of value" [42] that "does not adequately measure the premium that cable operators are willing to pay for certain types of programming in the analogous market for cable channels."[43]

28. Prior cable allocations have similarly rejected viewership as a measure of relative market value.[44] In the 2004-05 Final Cable Determination, the Judges rejected the use of

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[41] Written Direct Testimony of Randal D. Heeb, *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (corrected June 7, 2019) at ¶¶14-15.

[42] 2010-13 Final Cable Determination at 3599.

[43] 2010-13 Final Cable Determination at 3601.

[44] I am also aware that other economists have previously testified that viewership cannot be used as a measure of relative market value of distant signal programming. Statement of Steven S. Wildman, *In the Matter of 1990, 1991, and 1992 Cable Royalty Distribution Proceedings (*No. 94-3 CARP-CD90-92), August 15, 1992, JSC Ex. 28 (hereinafter "Wildman 1990-92 Cable WDT") at 9-15; Written Rebuttal Testimony of Gregory S. Crawford, Ph.D., *In the Matter of Distribution of the 2004 and 2005 Cable Royalty Funds (*No. 2007-3 CRB CD 2004-2205), December 19, 2009 at 10-11, JSC Ex. 10; Written Rebuttal Testimony of Gregory S. Crawford, Ph.D., *In Re: Distribution of Cable Royalty Funds* (No. 14-CRB-0010-CD (2010-13)), September 15, 2017, JSC Ex. 11 (hereinafter "Crawford 2010-13 Cable WRT") at ¶¶6-54; Written Rebuttal Testimony of Dr. Mark A. Israel, *In Re: Distribution of Cable Royalty Funds* (No. 14-CRB-0010-CD (2010-13)), September 15, 2017, JSC Ex. 14, at ¶¶31-47; Written Direct Testimony of Michelle Connolly, Ph.D., *In Re:*

viewership, noting that while viewership might be of interest to advertisers, it is not a useful measure of the relative market value of distantly retransmitted broadcast signals where cable systems do not earn any additional revenue from selling advertisements.[45] In the 1998-1999 Final Cable Determination, the Copyright Arbitration Royalty Panel ("CARP") similarly dismissed viewing as a measure of relative market value on the basis that viewership could not be used to measure the value of distant signals to CSOs.[46] The D.C. Circuit affirmed the CARP's decision and held that the CARP did not act "unreasonably in declining to rely on Nielsen for direct evidence of viewing."[47]

29.   Despite the Judges' prior decisions and the testimony of numerous economists, Dr. Gray opines again that "viewing levels alone *do* account for differing premiums" that certain categories of programming attract in the open market.[48] Although Dr. Gray now claims that his methodology "relies on far more than just raw estimated viewing data,"[49] the "enhanced viewing approach" he puts forward is essentially identical to the approach previously rejected by the Judges in the 2010-13 Final Cable Determination, and none of the minor changes that Dr. Gray introduces in this proceeding cure the defects that were described in the Judges' prior decision.

A.   Dr. Gray's "viewing" analysis repackages his previously-rejected viewing analysis

30.   In the 2010-13 Cable Proceeding, Dr. Gray opined that "relative program viewership provides a reasonable and reliable measure of the relative economic value of

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Distribution of Cable Royalty Funds (No. 14-CRB-0010-CD (2010-13)), December 22, 2016, JSC Ex. 9, at ¶¶26-33.

[45] Distribution of the 2004 and 2005 Cable Royalty Funds, Docket No. 2007–3 CRB CD 2004–2005, 75 FR 57063-57079 at 57070.

[46] Distribution of 1998 and 1999 Cable Royalty Funds, Docket No. 2001–8 CARP CD 98–99, 69 FR 3606-3620 at 3609.

[47] Program Suppliers v. Librarian of Congress, 409 F.3d 395, 402 (D.C. Cir. 2005).

[48] Gray 2010-13 Satellite WDT at ¶¶35-36 (emphasis in original).

[49] Gray 2010-13 Satellite WDT at ¶37.

distantly retransmitted programming."[50] To attempt to measure relative market value based on viewership, Dr. Gray relied on viewership data from Nielsen.[51] However, he noted that because of "the low frequency of distant viewing and the size of the sample Nielsen uses to measure total U.S. household viewing," the viewership data he relied on had many instances where data on distant viewership did not exist.[52] To estimate distant viewing where the Nielsen data were missing, Dr. Gray first performed a regression for each year from 2010 to 2013 that estimated the relationship between the total distant viewers for a program and the following factors:

- Dr. Gray's estimate of local viewership;[53]

- The total number of subscribers receiving the station as a distant signal;

- The time of day the program aired by quarter hours; and

- The type of program aired.[54]

31.   Dr. Gray used the results of his regression to estimate "viewing," which he asserted was an actual reflection of relative market value.[55]

32.   Now, in the current proceeding, Dr. Gray has put forward an analysis that relies on a similar regression for measuring viewing, except he has now labeled his analysis "enhanced viewing." As was the case in the 2010-13 Cable Proceeding, the viewership data that Dr. Gray relied on include instances (indeed, most instances) where information

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[50] Written Direct Testimony of Jeffrey S. Gray, Ph.D., *In Re: Distribution of Cable Royalty Funds* (No. 14-CRB-0010-CD (2010-13)), December 22, 2016 (amended March 9, 2017; corrected April 3, 2017), JSC Ex. 13 (hereinafter "Gray 2010-13 Cable WDT") at ¶40.

[51] Gray 2010-13 Cable WDT at ¶¶25-26.

[52] Gray 2010-13 Cable WDT at ¶35.

[53] Dr. Gray estimated local ratings by dividing local viewing by the number of total subscribers (both local and distant) receiving a signal. 2010-13 Final Cable Determination at 3598.

[54] Gray 2010-13 Cable WDT at ¶36.

[55] Gray 2010-13 Cable WDT at ¶40.

on distant viewing does not exist.[56] To remedy this, he again estimated a regression for each year that models the number of distant viewers for a program as a function of:

- The total number of subscribers receiving the station as a distant signal;

- The time of day the program aired by quarter hours; and

- The type of program aired.[57]

33. With the exception of no longer including the number of local viewers in his model, Dr. Gray's regression specification in this proceeding is *identical* to the regression specification he put forward in the 2010-13 Cable Proceeding. But, after acknowledging that the Judges in the 2010-13 Cable Proceeding rejected viewership as a measure of relative market value unless one also accounted for "additional evidence to account for the premium that certain categories of programming fetch in the open market," Dr. Gray now describes the controls included in his regression as "additional non-viewing factors."[58]

34. I disagree with Dr. Gray's characterization of the factors included in his regression as "non-viewing factors." The factors employed by Dr. Gray are used in his regression to predict only viewing, not how satellite carriers value programing.

35. To demonstrate how Dr. Gray's "enhanced viewing" analysis is nothing more than a study of viewership shares, I relied on the backup materials provided by Dr. Gray to calculate the distant viewing shares of compensable programming that he summarizes in Table 4 of his testimony, but using the raw Nielsen data on distant viewing instead of his "enhanced viewing" measures. In the following table, I summarize viewing shares based on Dr. Gray's Enhanced Viewing Model 1 (which he describes as his "preferred approach"[59]) alongside shares based on the raw Nielsen distant viewing data.

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[56] Dr. Gray's viewing study includes nearly 12.1 million records, but there is no distant viewing information for 11.3 million of these records. *See also* Written Rebuttal Testimony of William E. Wecker, Ph.D. and R. Garrison Harvey, *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), August 26, 2019 (hereinafter "Wecker and Harvey 2010-13 Satellite WRT") at ¶¶53-55.

[57] Gray 2010-13 Satellite WDT at ¶63.

[58] Gray 2010-13 Satellite WDT at ¶¶35-37.

[59] Gray 2010-13 Satellite WDT at ¶64.

Distant Viewing Shares of Compensable Programming
By Category and Year, 2010-13
Nielsen Distant Viewership Data vs. Dr. Gray's Enhanced Viewing Model 1

	Nielsen Distant Viewership Data	Dr. Gray's Enhanced Viewing Model 1
Joint Sports Claimants		
2010	12.9%	12.6%
2011	13.4%	13.3%
2012	12.1%	12.0%
2013	10.9%	10.8%
Average	12.3%	12.2%
Program Suppliers		
2010	72.7%	72.5%
2011	68.4%	66.8%
2012	70.6%	68.2%
2013	71.4%	70.4%
Average	70.8%	69.4%
Commercial TV		
2010	14.1%	14.3%
2011	18.0%	19.3%
2012	17.1%	19.6%
2013	17.6%	18.7%
Average	16.7%	18.0%
Devotional Programs		
2010	0.4%	0.7%
2011	0.2%	0.6%
2012	0.1%	0.2%
2013	0.1%	0.2%
Average	0.2%	0.4%

36.   Similarly, in the scatterplot below, viewing shares based on Dr. Gray's Enhanced Viewing Model 1 are depicted on the vertical axis while shares based on the raw Nielsen data are depicted on the horizontal axis. Each dot corresponds to the shares for a given category of programming in a year (e.g., Joint Sports Claimants' (JSC's) share in 2013 is represented by one dot, while Commercial TV's share in 2010 is represented by a separate

dot). I include a 45 degree reference line to indicate where the shares would fall if they were equivalent using these two methods.

37.   As this chart makes clear, Dr. Gray's approach results in viewership shares that are nearly identical to what one would calculate simply using the raw Nielsen data on distant viewership. Although Dr. Gray uses a regression to attempt to account for non-existent viewership data, his methodology remains an estimation of viewership shares, which the Judges have previously rejected as a measure of relative value.

Distant Viewing Shares of Compensable Programming
By Category and Year, 2010-13
Nielsen Distant Viewership Data vs. Dr. Gray's Enhanced Viewing Model 1
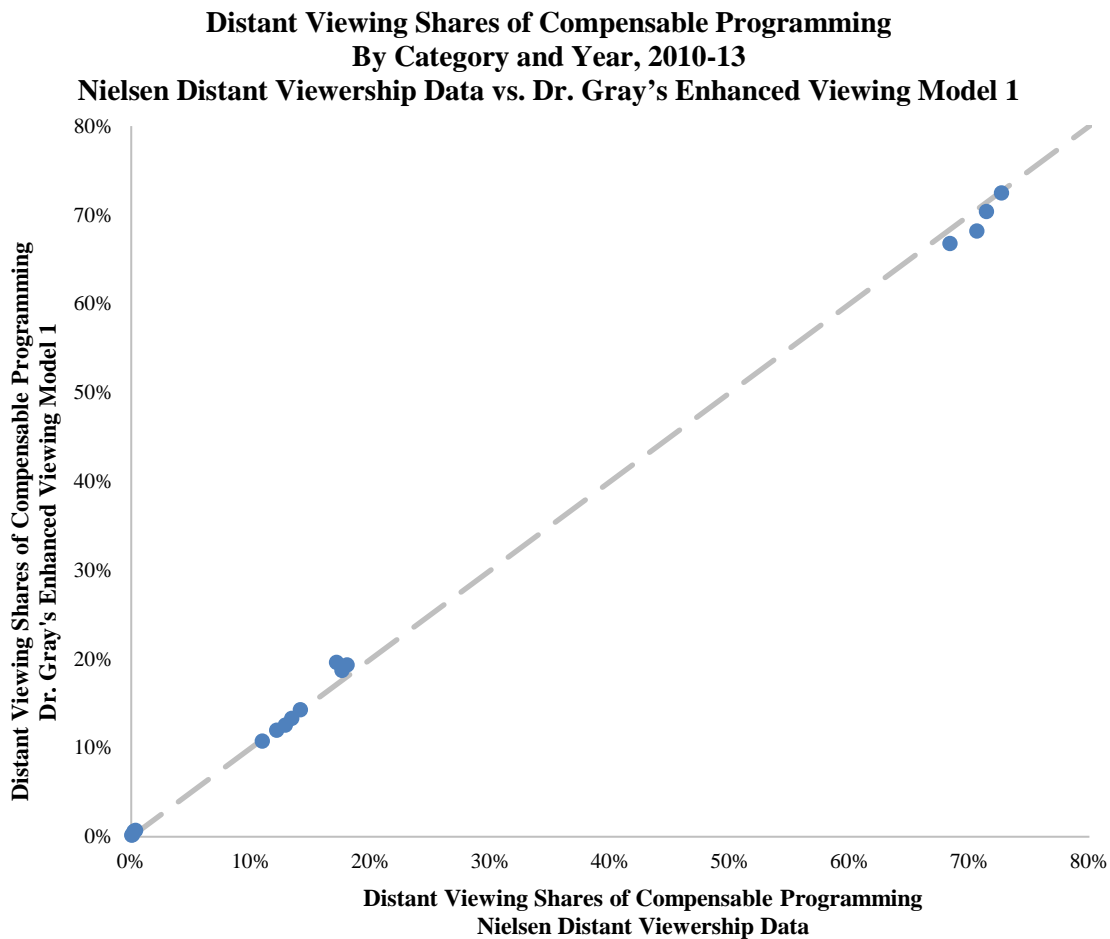
B.   Dr. Gray's "enhanced viewing" analysis treats all viewing hours the same and lacks a sound economic foundation

38.   Although the Judges have previously rejected viewership as a measure of relative market value because it does not explain the "premium that cable operators are willing to

Written Rebuttal Testimony of Andrew R. Dick, Ph.D. | 18

pay for certain types of programming,"[60] Dr. Gray has put forward an analysis that treats each hour of viewing as equally valuable. Not only does this approach run counter to the Judges' earlier decisions, but it is also inconsistent with the economics of the satellite television industry. Dr. Gray himself has offered no empirical evidence to show that his concept of relative "enhanced viewing" equals relative market value, and he ignores contrary empirical evidence.

39.   A satellite carrier's variable profits are largely determined by subscription revenues minus the cost of acquiring content.[61] Profits are not determined directly by program viewership. For example, a satellite carrier would earn equal subscription revenue and the identical profit from two subscribers who purchase the same package, one of whom watches television for every hour of every day, and the other who watches only an hour of television a week. Both subscribers pay the same monthly satellite service fee, and the cost of serving both subscribers is identical. Because cable and satellite operators are not allowed to sell advertising spots on retransmitted distant signals, there is no opportunity for the carrier to earn additional revenue based on differential viewership by selling advertising.[62]

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[60] 2010-13 Final Cable Determination at 3601.

[61] *See, e.g.,* DirecTV 10-K for the Fiscal Year Ended December 31, 2012 at 42 ("We earn revenues mostly from monthly fees we charge subscribers for subscriptions to basic and premium channel programming, advanced receiver fees (which include HD, DVR and multi-room viewing), pay-per-view programming, and seasonal live sporting events.") and 44 (showing DirecTV's largest cost category as "broadcast programming and other," which primarily includes "license fees for subscription service programming, pay-per-view programming, live sports and other events."); DISH Network Corporation 10-K for the Fiscal Year Ended December 31, 2012 at 24 ("Our programming costs currently represent the largest component of our total expense and we expect these costs to continue to increase.") and 62-65 (showing that more than 90 percent of DISH's revenue consists of "subscriber-related revenue"). *See also* Hartman 2010-13 Satellite WDT at ¶¶7, 12; Shull 2010-13 Satellite WDT at ¶9; Homonoff 2010-13 Satellite WDT at ¶¶25-26; Written Rebuttal Testimony of Daniel M. Hartman *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), August 26, 2019 (hereinafter "Hartman 2010-13 Satellite WRT") at ¶6.

[62] 17 U.S.C. 119(a)(5) prohibits "willful alterations" of a station's transmission by a satellite carrier "through changes, deletions, or additions." Similarly, 17 U.S.C. 111(c)(3) prohibits cable companies from altering distant signals carried under Section 111.

40.   The types of programming offered by a satellite carrier affect consumers' choice of whether to subscribe (or continue subscribing) to a satellite service.[63]   Therefore, it is the type of programming offered that generates market value for satellite carriers, and not the number of hours of viewership. If Dr. Gray were correct that viewership is a measure of relative market value, then one would expect to find that satellite carriers were willing to pay no more for any category of programming than could be justified based on the number of hours of viewership the programming garners.[64]   However, that is not the case.[65] MVPDs often pay more to carry cable networks with programming that they view as important for attracting and retaining subscribers, particularly networks featuring live team sports, even if these networks have less viewership than other, less expensive networks.[66]

41.   The disconnect between viewership and value can be seen in industry data. Mr. Trautman's analysis of cable network affiliate fees demonstrates that there is a wide disparity between cable networks' viewing levels and the license fees that MVPDs actually paid to carry the networks.[67]   Similarly, in the 2010-13 Cable Proceeding, Dr. Crawford noted that the affiliate fees paid by MVPDs to carry cable sports networks are higher than the fees paid to carry non-sports networks, even though many non-sports networks have higher viewership.[68]

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[63] Hartman 2010-13 Satellite WDT at ¶¶7, 11; Written Direct Testimony of Allan Singer, *In Re: Distribution of Cable Royalty Funds* (No. 14-CRB-0010-CD (2010-13)), December 22, 2016, JSC Ex. 5 (hereinafter "Singer 2010-13 Cable WDT") at ¶13.

[64] While Dr. Gray's viewership regressions include controls for program type, these regressions are simply used to impute estimates of distant viewership. Dr. Gray's regression analysis does not estimate relative value separately by type of programming.

[65] Written Rebuttal Testimony of David Shull *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), August 26, 2019 (hereinafter "Shull 2010-13 Satellite WRT") at ¶¶21-27; Hartman 2010-13 Satellite WRT at ¶¶14-23.

[66] Shull 2010-13 Satellite WDT at ¶¶9, 21-25; Hartman 2010-13 Satellite WDT at ¶¶8, 12-17; Hartman 2010-13 Cable WDT at ¶29.

[67] Written Rebuttal Testimony of James M. Trautman *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), August 26, 2019 (hereinafter "Trautman 2010-13 Satellite WRT") at 4-8 and Appendix A.

[68] Crawford 2010-13 Cable WRT at ¶¶33-36.

42.   Dr. Gray's opinion that viewing can be used to estimate relative market value is at odds with industry facts and data, and cannot explain why MVPDs routinely pay more to carry programming with less viewership. As the Judges noted in the 2010-13 Cable Final Determination, "[i]t is clear . . . that relative levels of viewership do not adequately explain the premium that certain types of programming can demand in the marketplace." [69] Therefore, Dr. Gray's approach fails the professional standard that economists set for rigorous and accepted economic analysis: "a model of the competitive process fits the industry if it explains the past at a fairly high level of generality."[70]

43.   Economists assess the market value of a product by examining its relative scarcity and the marginal utility derived from consuming the product.   However, Dr. Gray's viewing analysis considers neither of these factors.   As I explain below, proper consideration of product scarcity and marginal utility is necessary in order to correctly estimate the relative market value of programming on distant signals delivered by satellite carriers.

1.   Dr. Gray's analysis does not consider the relative scarcity of JSC programming

44.   It is a well understood economic principle that relatively scarce products will tend to have higher market value, other factors being equal.[71] For example, the market price for an original painting by a well-known artist will be much higher than the price for a lithograph copy of the same work. But Dr. Gray has not applied this fundamental economic principle in his viewing analysis, where each hour of programming is treated equal, regardless of whether it is an hour of sitcom reruns or an hour of a live telecast of the Super Bowl.

45.   Ignoring the economic principle of scarcity leads Dr. Gray's methodology to produce fatally flawed estimates of relative market value. This is particularly acute for

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[69] 2010-13 Cable Final Determination at 3600.

[70] Gregory J. Werden, Luke M. Froeb and David T. Scheffman, "A Daubert Discipline for Merger Simulation," *Antitrust* 18 (Summer 2004): 89-95 at 90.

[71] Michael L. Katz and Harvey S. Rosen, *Microeconomics* (Irwin/McGraw Hill, 3rd ed., 1998) at 16 ("By signaling what is relatively scarce and what is relatively abundant, prices can efficiently channel production and consumption).

JSC programming, which is relatively rarer than other types of programming. Live team sports programming is scarce: there are only a finite number of teams each playing a finite number of games per season, and interest in these games rapidly diminishes after the conclusion of their live broadcasts. Because it is difficult to predict at the beginning of a professional sports season precisely which games will be the most exciting for viewers, consumers may place a premium on the *availability* of live team sports broadcasts when choosing to subscribe to an MVPD to ensure that they do not miss a live broadcast of a key game.[72] As the FCC explained, "major sporting events are typically viewed as 'premium' programming" with "little value beyond their initial telecast because there is very little interest in an event once the results are known," which has led to higher rights fees paid by broadcast and cable networks to carry these games.[73]

46. During the 2010 to 2013 time period, MVPDs regarded live team sports programming as particularly valuable because, unlike other categories of programming, viewers prefer to watch sports programming live, which led some industry analysts to consider broadcasts of live team sports to be "DVR-proof." [74] In contrast, syndicated sitcoms and dramas (the type of programming comprising the Program Suppliers' claims) are plentiful. Mr. Homonoff's study of cable networks (discussed in more detail below)

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[72] Wildman 1990-92 Cable WDT at 12-15. As Dr. Wildman explained, one must consider the "option value," which economists also refer to as "option demand," of programming. Option value describes how consumers may enjoy utility from the *availability* of a good or service beyond the utility they enjoy from consuming the good or service. Economists have long understood that option demand plays a role in the value of programming. *See, e.g.,* Stanley M. Besen, "The Economics of the Cable Television 'Consensus'," *Journal of Law & Economics*, 17(1) (April 1974): 39-51 at 50 ("[E]ven where channel capacity is not a binding constraint, the amount that advertisers alone are willing to pay may not be sufficient to attract the resources needed to provide local programming. But viewers, *even those who seldom watch these programs*, may be willing to provide these resources. If the additional value that viewers place on having local programming available exceeds the additional cost of providing it to them, cable operators will find it profitable to provide such programming.") (emphasis added). Economists have applied the concept of option demand in estimating consumers' willingness to pay for bundles of goods and services. *See, e.g.,* Cory Capps, David Dranove, and Mark Satterthwaite, "Competition and market power in option demand markets," *RAND Journal of Economics* 34(4) (Winter 2003): 737-763.

[73] Federal Communications Commission, *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, July 22, 2013 at ¶343.

[74] Adam Swanson, SNL Kagan Economics of Networks, "Sports content continues to bolster license fees in 2011" September 10, 2012 and Adam Swanson, SNL Kagan Economics of Networks, "Local coverage a boon to RSN ratings?" March 2, 2011. *See also,* Shull 2010-13 Satellite WRT at ¶¶22-23; Hartman 2010-13 Satellite WRT at ¶10.

demonstrates the enormous volume of Program Suppliers content available on cable networks and the relative scarcity of JSC programming on those networks. According to Mr. Homonoff's analysis, Program Suppliers content comprised more than 91 percent of the total minutes of programming on the 50 most widely carried cable networks during 2010-13, while JSC programming comprised only one percent.[75] There is virtually unlimited availability of non-sports programs from countless producers, including major TV studios, Netflix, Hulu, Amazon, and other internet distributors that consumers can access without a video subscription from an MVPD. Consistent with this, a former DirecTV executive described non-sports programming as "increasingly fungible."[76] Similarly, a former cable executive explained that "over time general entertainment programming has become more and more homogeneous, undifferentiated and accessible to viewing whenever and wherever one wants it and on an abundance of platforms."[77]

47.   Despite the relative scarcity of live team sports programming and the relative abundance of sitcoms, dramas, and other general entertainment programs, Dr. Gray's viewing analysis treats each hour of distant viewership equally.[78] This violates core economic principles, and renders Dr. Gray's estimate of relative market value fatally flawed.

2.   Dr. Gray's analysis does not properly consider the marginal utility of JSC programming

48.   Dr. Gray claims that "a measure of the happiness, or 'utility,' an individual subscriber gets from a specific program is the number of minutes that subscriber spends viewing the program offered to him or her by the satellite system."[79] I disagree that this is

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[75] Homonoff 2010-13 Satellite WDT at ¶50 and Figure 3.

[76] Hartman 2010-13 Cable WDT at ¶¶27, 32.

[77] Singer 2010-13 Cable WDT at ¶17.

[78] Assuming that each hour of viewership is equally valuable is inconsistent with economic principles and with the business realties of television. In the cable content analysis he performed in the 2010-13 Cable Proceeding, Dr. Israel found that the top 25 cable networks spent 22.68 percent of their total programming expenditures on JSC programming even though JSC programming corresponded to just 2.96 percent of total household viewing hours. Written Direct Testimony of Dr. Mark A. Israel, *In Re: Distribution of Cable Royalty Funds* (No. 14-CRB-0010-CD (2010-13), December 22, 2016, JSC Ex. 4 (hereinafter "Israel 2010-13 Cable WDT") at ¶47.

[79] Gray 2010-13 Satellite WDT at ¶21.

the correct measure of subscriber utility because it does not allow for the likelihood that subscribers will value a minute of programming differently depending on what they are watching. For example, a subscriber may receive higher utility from watching a first-run episode of a sitcom than he does from watching a re-run of the same episode several months later. More importantly, however, it would be incorrect to focus solely on the utility of viewers when estimating relative market value because viewers are neither licensors nor licensees in the hypothetical market for distant signals. Because satellite carriers choose to carry distant signals, it is correct to view satellite carriers as the licensee in this hypothetical market when assessing relative market value.[80]

49.   Utility is the satisfaction that the consumer receives from using a product, and *marginal* utility is the satisfaction received from the *final unit* of the product consumed.[81] Marginal utility diminishes with the amount of consumption (e.g., a person will value more dearly the first hamburger consumed as compared to the tenth hamburger). Products that generate higher marginal utility will tend to have greater market value, other things being equal.

50.   As I explained in my direct testimony, CSOs and satellite carriers offer programming to subscribers in bundles.[82] An MVPD will increase the attractiveness of a bundle to its subscribers and potential subscribers most effectively by adding content that is more differentiated and highly valued by a passionate group of consumers.[83] Even if the content that is added to the bundle has relatively lower viewership, its value to the MVPD is measured by whether it helps to attract or retain subscribers, since the revenue earned from a given subscriber does not vary with the number of hours that the subscriber watches television. For this reason, an MVPD's marginal utility is not driven by viewership.

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[80] This is consistent with how the Judges articulated the hypothetical market in the 2010-13 Final Cable Determination. 2010-13 Final Cable Determination at 3555.

[81] Fred M. Gottheil, *Principles of Economics* (7th ed.), South-Western Cengage Learning, 2013 at 111 ("How much people value a good depends upon the utils they derive *from the last one consumed*.") (emphasis in original).

[82] Dick 2010-13 Satellite WDT at ¶25.

[83] Gregory S. Crawford and Ali Yurukoglu, "The Welfare Effects of Bundling in Multichannel Television Markets," *American Economic Review* (2012), 102(2):643-685 at 647.

3. Dr. Gray's analysis does not consider the unique attributes of JSC programming

51.   Live sports broadcasts have unique attributes that differentiate that programming from non-sports programming. A former DirecTV programming director described live sports broadcasts as "one-of-a-kind," with fans who will "not hesitate to quickly switch video providers if their particular team is not available on their current provider."[84] Conversely, subscribers are less likely to switch providers if a distant signal carrying non-sports programming is dropped as there are other substitute channels available with similar programming.[85] A former cable executive explained that because of the unique nature of live team sports, it is a strong differentiator when MVPDs choose whether or not to carry a signal.[86] Similarly, a former executive at DISH explained that the satellite carrier "was far more likely to lose subscribers if it failed to carry live team sports programming as compared to reruns of sitcoms or old movies."[87] This, along with the product scarcity and marginal utility factors I discussed above, explains why MVPDs are willing to pay more to carry networks with live team sports broadcasts than they are for other types of networks, even when the other networks may have greater viewership. Dr. Gray acknowledges that there is a premium for certain types of programming, and he claims that his viewership study reflects this.[88] However, that is simply not the case.

4. Dr. Gray's viewing-to-volume analysis is not supported by economics

52.   To support the claim that his viewing analysis reflects the premium associated with certain categories of programming, Dr. Gray compared the viewing shares he calculated using his "Enhanced Viewing Model 1" to shares of compensable hours of programming, weighted by subscribers.[89] He then divided the viewing share for each category by the

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[84] Hartman 2010-13 Cable WDT at ¶24.

[85] Hartman 2010-13 Cable WDT at ¶¶25-26.

[86] Singer 2010-13 Cable WDT at ¶¶15- 17, 24.

[87] Shull 2010-13 Satellite WRT at ¶23.

[88] Gray 2010-13 Satellite WDT at ¶¶35-38, 60, 71-72.

[89] Gray 2010-13 Satellite WDT at ¶¶71-72.

corresponding share of hours to calculate a "viewing to volume" ratio. Dr. Gray then claims that "[t]he ratios greater than one for Program Suppliers and JSC reflect higher valuation premiums for these two categories of programming."[90] There are simply no economics to support this claim.

53.   In the 2010-13 Cable Proceeding, Dr. Gray performed an analysis of the relative number of minutes of programming by category. The Judges in that proceeding chose not to rely on Dr. Gray's analysis owing to his admission that volume was not sufficient to determine relative market value.[91] The Judges in that proceeding also dismissed Dr. Gray's viewership analysis as a viable measure of relative market value. Now, Dr. Gray divides one of these flawed analyses by the other to claim that his viewership study reflects the premium that MVPDs pay for some categories of programming.

54.   Dr. Gray offers no explanation as to why the ratios he calculates are consistent with relative market value. The viewing-to-volume ratios indicate that certain categories of programming generate more viewing per hour than other categories of programming, but because neither viewing nor volume is a measure of value, increased viewing ratios do not equal increased value.[92] As shown in Mr. Trautman's analysis of cable network affiliate fees and ratings data, the premium for JSC content is much larger than Dr. Gray suggests— MVPDs pay a higher premium for JSC programming than for other types of programming with similar or greater levels of viewing.[93]

C.   Dr. Gray's volume measures do not measure relative market value

55.   Although Dr. Gray ultimately bases his estimate of relative market value on viewership shares, he also considers volume shares in his direct testimony. Dr. Gray's

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[90] Gray 2010-13 Satellite WDT at ¶72.

[91] 2010-13 Final Cable Determination at n. 148.

[92] Dr. Gray's viewing-to-volume ratios ignore the economic concept of option value. See *supra* n. 72.

[93] Trautman 2010-13 Satellite WRT at 4-8 and Appendix A.

volume measures of relative market value considers the number of broadcasts and the number of hours of distant signal programming by category.[94]

56.   Dr. Gray offered a similar analysis of volume shares in the 2010-13 Cable Proceeding, but the Judges gave this analysis no weight due to Dr. Gray's admission that volume alone was not sufficient to determine relative market value.[95] In his direct testimony in this proceeding, Dr. Gray similarly concedes that volume is not a reliable measure of relative market value. Dr. Gray deems volume as a "rough measure" of relative value, and explains that volume measures "should be deemed only as approximate measures of value."[96] He admits that volume measures do not consider that programming at different parts of the day may have different value for subscribers, and volume measures are blind to whether any subscribers even chose to watch the program.[97]

57.   In summary, Dr. Gray's volume measures improperly conflate program *volume* and program *value*. For the reasons I described throughout this section and describe further in Section V.A below, MVPDs do not value all hours of programming equally, regardless of whether one is counting hours of viewership or simply hours of available programming.

V.   HOMONOFF'S CABLE NETWORK ANALYSES ARE SIMPLY VOLUME MEASURES

A.   Homonoff's volume analyses do not provide a sound basis for determining relative market values

58.   Program Suppliers' industry expert Howard Homonoff relies on volume measures to assess the relative market value of programming. As I explained in Section IV, volume alone does not provide a valid economic basis for determining relative market value, and the Judges correctly rejected volume measures in the 2010-13 Cable Proceeding. Moreover, even taking Mr. Homonoff's volume approach at face value, his data on network

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[94] Gray 2010-13 Satellite WDT at ¶¶49-55. Dr. Gray now includes a measure of volume that is weighted by subscribers. Gray 2010-13 Satellite WDT at ¶¶54-55 and Table 3. While weighting by subscribers may provide a more accurate measure of volume, it is still not economically appropriate to measure value based on volume alone.

[95] 2010-13 Final Cable Determination at n. 148.

[96] Gray 2010-13 Satellite WDT at ¶49.

[97] Gray 2010-13 Satellite WDT at ¶59.

affiliate fees itself shows that volume does not equate to value. Based on Mr. Homonoff's own data, there is not a systematic relationship between network affiliate fees and total subscribers, and many of the *most widely carried* networks have *lower affiliate fees* than less-widely carried networks. As a result, Mr. Homonoff's analysis provides neither a sound economic methodology nor reliable empirical evidence that could inform the Judges' allocation of satellite retransmission royalties in this proceeding.

59.   Mr. Homonoff purports to analyze programming value by associating economic value with subscribership within the context of what he calls the "Top 50" cable networks during the 2010-13 period.[98] His analysis is flawed as a matter of economics because a network's presence among the most carried networks is not indicative of its economic value. If a network's presence among the most carried networks *were* indicative of value, one would expect to observe a systematic relationship between a network's subscribership ranking and the affiliate fees that MVPDs are willing to pay for the network. Based on Mr. Homonoff's own tables, however, it is clear that the volume of subscribers that any particular network has does not determine the value that an MVPD assigns to that network's programming.[99]

60.   The following example demonstrates the lack of correlation between subscribership and economic value to an MVPD. According to Mr. Homonoff's data, over the period 2010-13, the Food Network was one of the most widely distributed cable networks, with an average 99.6 million annual subscribers. Yet this network's average monthly affiliate fee was only $▮▮ per subscriber during the period 2010-13, which is less than one-half

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[98] Consistent with the terminology used by Mr. Homonoff, I use the term "cable networks" to refer to channels carried by MVPDs, including by CSOs and satellite carriers. Homonoff 2010-13 Satellite WDT at ¶10.

[99] As I explained in my direct testimony, some cable networks allow MVPD to sell advertising spots, while MVPDs are not permitted to insert advertisements into distant broadcast signals. While the opportunity to sell advertisements may play a role in differences in affiliate fees earned by cable networks, the impact is likely small. For example, SNL Kagan estimates that in each year between 2011 and 2013, advertising revenue accounted for only 2.6% to 3.0% of satellite carriers' total revenue. Mari Rondeli, "DBS facing modest long-term customer losses," *SNL Kagan Multichannel Market Trends*, August 28, 2012 (and accompanying spreadsheet). An SNL analysis of revenues for ten large CSOs in 2012 and 2013 found that advertising accounted for between 4.2% and 5.8% of quarterly revenue, peaking in the fourth quarter of 2012 with an increase in political advertisement spending. Tony Lenoir, "Q3 cable ad revenues tank, but YTD results steady thanks to core categories," *SNL Kagan Multichannel Market Trends*, November 22, 2013.

the average monthly affiliate fee for the top 50 cable networks for this period. In contrast, CNBC—which was the 28th ranked cable network during this period with an average of 97.4 million subscribers—received an average monthly affiliate fee of $███ per subscriber, which is 82 percent more than what the Food Network earned.[100]

61.   There are multiple other examples of network-pairs within the "Top 50" for which the *more widely* distributed network has the *lower* average affiliate fee. Examples include:

   a. VH1, which garnered an average of 97.7 million subscribers over the period 2010-13 and an average monthly affiliate fee of $███ per subscriber vs. the National Geographic Channel, which attracted an average of only 77.5 million annual subscribers but an average monthly affiliate fee of $███.

   b. HGTV, which garnered an average of 98.7 million subscribers over the period 2010-13 and an average monthly affiliate fee of $███ per subscriber vs. Turner Classic Movies, which attracted an average of only 81.1 million annual subscribers but an average monthly affiliate fee of $███.

   c. Cartoon Network, which garnered an average of 98.8 million subscribers over the period 2010-13 and an average monthly affiliate fee of $███ per subscriber vs. CNBC, which attracted an average of 97.4 million annual subscribers but an average monthly affiliate fee of $███.

62.   Moreover, there are many instances of networks with similar numbers of subscribers but very different per-subscriber fees. Examples include:

   a. TNT and the Food Network, both of which averaged 99.6 million subscribers over the period 2010-13, but attracted monthly average affiliate fees of $███ and $███, respectively.

   b. ESPN and Lifetime, both of which averaged 98.9 million subscribers over the period 2010-13, but attracted monthly average affiliate fees of $███ and $███, respectively.

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[100] Homonoff 2010-13 Satellite WDT at Table 1 and Exhibit 4.

     c. Disney Channel and the History Channel, both of which averaged 98.6 million subscribers over the period 2010-13, but attracted monthly average affiliate fees of $⬛ and $⬛, respectively.

     d. Fox News Channel, which averaged 98.0 million subscribers over the period 2010-13 and earned an average monthly affiliate fee of $⬛, and Comedy Central, which averaged 98.3 million subscribers and an affiliate fee of $⬛.

63.   In summary, because Mr. Homonoff's own tables do not show a systematic tendency for the most widely carried networks to have the highest affiliate fees—and, in fact, often show the opposite relationship—Mr. Homonoff's contention that a network's presence in the top 50 most carried networks is indicative of value is refuted by the data.

B.   Homonoff's own analysis contradicts his contention that Program Suppliers' content is the most valued

64.   Exhibit 4 of Mr. Homonoff's testimony indicates that the top 50 cable networks earned affiliate fees, in aggregate, of $18.97 per subscriber per month during the 2010-13 period. Of this $18.97, $11.08 was associated with affiliate fees for the 40 cable networks that Mr. Homonoff treats as Program Supplier networks. The three sports channels included in Mr. Homonoff's top 50 network chart received aggregate affiliate fees of $5.80 per subscriber per month. Based on this, Mr. Homonoff contends that sports content is worth less to MPVDs than program suppliers' content.

65.   Mr. Homonoff's contention has no economic foundation. According to his own data, the highest affiliate fee among top 50 cable networks was for ESPN, which averaged $⬛ in affiliate fees per subscriber per month during the period 2010-13. In order to select Program Supplier networks (based on Mr. Homonoff's categorization) to reach a similar aggregate affiliate fee as the ESPN network alone, one would need to include at a minimum *more than six* Program Supplier stations. The total cost of carrying the TNT, Disney Channel, USA, TBS, Nickelodeon, and FX networks was $⬛ per subscriber per month, and adding the MTV network would bring this total to $⬛ per month. This illustrates that MVPDs are willing to pay the same amount for *the one* most highly-valued sports network as they are for *the six* most highly-valued program supplier networks.

66. This illustration is even more striking when considering that Mr. Homonoff's analysis ascribes each network's affiliate fees to a single program category, even when the network has programming in other program categories. For example, Mr. Homonoff categorizes TBS and TNT as "PSE Networks," which he claims carry "programming most analogous to the content claimed by the Program Suppliers claimant group in this proceeding."[101] As former MVPD programming executives have testified, however, the live team sports broadcasts on TBS and TNT were particularly valuable programming on those networks.[102] Additionally, the cable content analysis that Dr. Israel presented in the 2010-13 Cable Proceeding shows that more than 40 percent of TBS's and TNT's program expenditures were for JSC content, even though JSC content accounted for only two to three percent of total programming hours on these networks.[103]

67. According to Mr. Homonoff's analysis of cable networks, it would take more than 11 of the highest subscriber program supplier networks to produce nearly as much in total affiliate fee revenue as ESPN.[104] Mr. Homonoff's analysis also would imply that MVPDs are willing to pay the same amount for *one* average-valued sports network ($1.93 per subscriber per month) as they are for *nearly seven* average-valued Program Supplier networks ($0.28 per subscriber per month).

68. As these examples illustrate, real-world market data refute Mr. Homonoff's contention that program volume (as reflected in network subscribership) reflects economic value (as measured by the affiliate fees that MVPDs are willing to pay for network carriage).

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[101] Homonoff 2010-13 Satellite WDT at ¶40.

[102] Shull 2010-13 Satellite WDT at ¶24; Hartman 2010-13 Satellite WDT at ¶15.

[103] Israel 2010-13 Cable WDT at ¶¶49-51.

[104] According to Mr. Homonoff's report, ESPN earned an average fee of $███ per subscriber per month and had an average of 98.9 million annual subscribers between 2010 and 2013. This implies average annual affiliate fee revenue of $██ billion. By comparison, Mr. Homonoff's data imply that the 11 most carried "Program Suppliers/Entertainment" (or "PSE") networks collectively earned average annual affiliate revenue of $██ billion. These 11 networks are the Food Network, the Discovery Channel, TNT, TBS, Cartoon Network, Nickelodeon, USA, A&E, Lifetime, HGTV, and TLC.

VI. DUE TO DATA LIMITATIONS, FEE-BASED REGRESSIONS CANNOT BE ESTIMATED USING SATELLITE STATEMENTS OF ACCOUNT

69. In the 2010-13 Final Cable Determination, the Judges relied primarily on a regression analysis conducted by Dr. Crawford.[105] In their decision, the Judges refer to Dr. Crawford's regression analysis as a "Waldfogel-type regression" because it is similar to the approach taken by Dr. Joel Waldfogel in the 2004-05 Cable Proceeding.[106] In this regression approach, the royalties paid by a CSO are modeled as a function of subscriber and cable system characteristics, as well as the number of minutes of distant signal programming delivered to subscribers by programming category. The Judges found Dr. Waldfogel's analysis relevant in the 2004-05 Cable Proceeding, and described the regression analysis performed by Dr. Crawford as "the most persuasive methodology overall on this record" for estimating relative market value in the 2010-13 Final Cable Determination.[107]

70. Due to the manner in which Section 119 royalty payments are calculated for distant signal carriage by satellite carriers and differences in data reporting between the Section 111 royalties for cable and the Section 119 royalties for satellite, a similar regression model cannot be estimated using satellite data. This does *not*, however, imply that the 2010-13 Final Cable Determination cannot be applied as a benchmark for determining the relative market value of programming distantly retransmitted by satellite carriers between 2010 and 2013. As I discussed in my direct testimony, the Final Cable Determination satisfies the standard articulated by the Judges for establishing a relevant benchmark. Moreover, the 2010-13 Final Cable Determination did not rely on Dr. Crawford's regression in isolation. Rather, the Judges remarked that they were "struck by the relative consistency of the results across the accepted methodologies" they considered in the Final Cable Determination, including results of surveys of CSO executives.[108]

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[105] 2010-13 Final Cable Determination at 3610-11.

[106] 2010-13 Final Cable Determination at 3556-58.

[107] 2010-13 Final Cable Determination at 3557, 3610.

[108] 2010-13 Final Cable Determination at 3610.

A. Data on cable and satellite distant signal royalties are structured differently

71.   Large cable systems' Section 111 royalty payments are calculated as a percentage of gross receipts, where the percentage varies with the number and type of distant signals carried.[109] Prior to 2010, CSOs' royalties were calculated on a system-wide basis, but since the passage of the Satellite Television Extension and Localism Act of 2010, Section 111 royalties have been paid on a subscriber group basis. As Dr. Crawford explained in his testimony, a subscriber group includes a set of communities that receive the same distant signals from a CSO.[110]

72.   To facilitate collection of Section 111 royalties, large cable systems must file a "Statement of Account" form with the Copyright Office semi-annually.[111] On this form, a CSO calculates the Section 111 royalties it owes and lists the call signs of the distant signals it carries to each subscriber group.[112] Dr. Crawford's regression relies on data from these forms in his regression analysis. During the 2010-13 Cable Proceeding, Dr. Crawford analyzed Statement of Account data from 3,266 subscriber groups spanning 921 cable systems.[113]

73.   Under Section 119, the distant signal royalties paid by satellite carriers are calculated using a different formula than is used for the Section 111 royalties paid by CSOs. This results in important differences in the level of aggregation at which satellite royalty data are reported relative to the cable data. Most notably, satellite carriers pay Section 119 royalties on a per-subscriber, per-station basis. On a semi-annual basis, each satellite carrier files a Statement of Account with the Copyright Office that lists all distant signals carried, and the number of subscribers receiving each signal in each month, separately for

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[109] 2010-13 Final Cable Determination at 3554.

[110] Written Direct Testimony of Gregory S. Crawford, Ph.D., *In Re: Distribution of Cable Royalty Funds* (No. 14-CRB-0010-CD (2010-13)), December 22, 2016 (corrected April 11, 2017), JSC Ex. 1 (hereinafter "Crawford 2010-13 Cable WDT") at ¶65.

[111] 17 U.S.C. 111(d)(1)(A).

[112] *See, e.g.,* United States Copyright Office, Form SA3, Statement of Account for Secondary Transmissions by Cable Systems (Long Form), Effective for Accounting Periods Beginning July 1, 2010.

[113] Crawford 2010-13 Cable WDT at Fig. 9.

commercial and residential subscribers. [114] A satellite carrier's Section 119 royalty payment is calculated by applying a flat, annually updated per-subscriber fee to each of these station months. [115] For example, in 2013, satellite carriers paid 54 cents per distant signal, per month for each commercial subscriber and 27 cents per distant signal, per month for each residential subscriber. [116] Satellite carriers do not report information on subscriber groups in the Statements of Account they file.

74.   The lack of subscriber groups in the satellite royalty data means that one cannot identify the bundle of distant signals being received by subscribers. In addition to providing information on which signals are being received by common sets of subscribers, subscriber groups also provided variation on royalty payments within a cable system, which Dr. Crawford explained was helpful in estimating parameters in his regression model. [117] Without subscriber group information, the only variation in satellite royalties that can be examined is variation across satellite carriers. However, because there are only six satellite systems in the royalty data, and only three of these systems carried distant signals in each year from 2010 to 2013, there is very little data variation to examine in a regression model. [118]

B.   New regressions proffered by Drs. Gray and Erdem confirm that a Waldfogel-type regression cannot be estimated using satellite data

75.   In the current proceeding, Drs. Gray and Erdem have each attempted to estimate Waldfogel-type regressions using satellite data, despite the data limitations I described above. Neither advocates using a fee-based regression to allocate Section 119 royalties. [119] The approaches taken by Dr. Gray and Erdem differ in how they deal with the lack of

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[114] *See, e.g.*, United States Copyright Office, Form SC, Statement of Account for Secondary Transmissions by Satellite Carriers of Distant Television Signals, Effective for the Accounting Period Beginning January 1, 2018.

[115] Erdem 2010-13 Satellite WDT at ¶23.

[116] Erdem 2010-13 Satellite WDT at ¶66.

[117] Crawford 2010-13 Cable WDT at ¶126.

[118] Erdem 2010-13 Satellite WDT at ¶¶57-61.

[119] Erdem 2010-13 Satellite WDT at ¶7; Gray 2010-13 Satellite WDT at ¶¶75-76.

subscriber group-level data. Dr. Gray estimates a regression model after aggregating satellite royalty data to the system-level, with either semi-annual or monthly information used for each system.[120] This results in Dr. Gray's model not being able to precisely estimate relative market values across programming categories. Dr. Erdem relies on more disaggregated data to demonstrate that a Waldfogel-type regression cannot be estimated at the station-level.[121] Because Section 119 royalty payments are calculated using a simple station-level formula based on subscribership, there is simply no variation at the station-level that can be used to estimate relative market values.

1. Dr. Gray's analysis demonstrates why a Waldfogel-type regression cannot be estimated based on data aggregated by satellite system

76. In his testimony in this proceeding, Dr. Gray reiterates the critiques he made in the 2010-13 Cable Proceeding regarding the use of a Waldfogel-type regression to estimate relative market value. Dr. Gray opines that because royalty payments are defined by statute, a regression that analyzes these payments cannot be used to estimate relative market value. Additionally, Dr. Gray opines that the minimum royalty payments required under Section 111 render Dr. Crawford's regression estimates unreliable.[122] In the 2010-13 Cable Proceeding, the Judges rejected similar arguments put forward by Dr. Erdem, explaining that "[t]he Judges have found previously that Waldfogel-type regressions are relevant in cable distribution proceedings and find nothing in Dr. Erdem's testimony in the current proceeding to support changing that position."[123]

77. Despite his critiques, Dr. Gray attempts to estimate a Waldfogel-type regression with satellite data. As I discussed previously, one challenge in estimating such a regression using satellite data is that subscriber royalty data are not tracked by subscriber group. Dr. Gray therefore estimates his model using royalty data at the system level.[124] However,

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[120] Gray 2010-13 Satellite WDT at ¶94.

[121] Erdem 2010-13 Satellite WDT at ¶67.

[122] Gray 2010-13 Satellite WDT at ¶75.

[123] 2010-13 Final Cable Determination at 3557.

[124] Gray 2010-13 Satellite WDT at ¶94.

unlike cable television where data are available from more than 900 cable systems, Dr. Gray's satellite data include only six systems.[125]   With so few systems, Dr. Gray's regression cannot find statistically significant results.

78.   All else being equal, the statistical significance of a regression estimate is increased when the number of observations being analyzed is relatively larger than the number of coefficients included in the regression model.[126] With drastically fewer observations in his regression data, Dr. Gray is only able to estimate regression coefficients based on variation within six satellite carriers, instead of the more than 900 cable systems (each of which included one or more subscriber groups), as Dr. Crawford did in the 2010-13 Cable Proceeding. Not surprisingly, this results in *none* of the regression model's coefficients for any of the programming categories being statistically significant when Dr. Gray estimates his satellite regression using data by accounting period.[127] When Dr. Gray estimates his model using monthly data, the coefficient for only one of the four programming categories is statistically significant at the 10 percent significance level, but *none* is statistically significant at the conventional 5 percent significance level.[128] The lack of statistical significance in these estimates does *not* imply that there is no relationship between programming categories and satellite systems' willingness to pay for distant

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[125] Crawford 2010-13 Cable WDT at Fig. 9. Dr. Gray's regression tables indicate that his data include only six systems, which is consistent with Dr. Erdem's description of available satellite data. Gray 2010-13 Satellite WDT at App. F; Erdem 2010-13 Satellite WDT at ¶58.

[126] *See, e.g.,* Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach* (South-Western, Cengage Learning., 5th ed., 2013) at 99-101.

[127] Gray 2010-13 Satellite WDT at Table 7 and Appendix F. Dr. Gray reports the conventional cluster-robust standard errors. However, in regressions estimated with only a few clusters, as is the case with Dr. Gray's regressions, the use of conventional cluster-robust standard errors can lead to confidence intervals that are too narrow. While there is no clear-cut threshold for the number of clusters when this issue arises, practitioners are advised to apply various types of refinements in instances with less than twenty or even less than fifty clusters. Although Dr. Gray's regression includes only six clusters, he makes no such refinements. *See* A. Colin Cameron and Douglas L. Miller, "A Practitioner's Guide to Cluster-Robust Inference," *Journal of Human Resources*, 50(2) (Spring 2015): 317-372.

[128] Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach* (South-Western, Cengage Learning., 5th ed., 2013) at 123-124; Franklin M. Fisher, "Multiple Regression in Legal Proceedings," *Columbia Law Review*, 80(4) (May 1980): 702-736 at 717-718.

signals.   However, it *does* mean that Dr. Gray's regression cannot reliably measure differences in relative market values between programming categories.[129]

2.   Dr. Erdem's analysis demonstrates why a Waldfogel-type regression cannot be estimated based on satellite data at the station-level

79.   In his testimony in this proceeding, Dr. Erdem reiterates the same criticisms of Waldfogel-type regressions that he offered in the 2010-13 Cable Proceeding, although he acknowledged that these criticisms were given little to no weight in the 2010-13 Final Cable Determination.[130] Dr. Erdem now offers a strawman regression model applied to station-level satellite data which he claims to have constructed with Dr. Crawford's intent in mind.[131] Rather than critiquing a regression model that has been put forward in this proceeding by another expert, Dr. Erdem invents a model that he creates with known flaws, and then points to these flaws in his own model in an attempt to discredit Dr. Crawford's cable regression.

80.   Dr. Erdem acknowledges that because of the smaller number of satellite systems relative to cable systems and the lack of subscriber group information for Section 119 royalties, the number of observations available for a regression analysis of Section 119 royalties is much less than the number of observations Dr. Crawford relied on in his

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[129] Tests of statistical significance assess whether one can reject the null hypothesis being tested in the regression. The null hypothesis for a parameter in a multiple regression analysis is that it is equal to zero. For example, when minutes of devotional programming is included in a Waldfogel-type regression, the null hypothesis is that this parameter is zero. If the estimated parameter for devotional programming is found to be statistically significant, this means the null hypothesis is rejected (*i.e.*, one concludes, with a defined degree of certainty, that the parameter is actually not equal to zero). A lack of statistical significance means that the null hypothesis is *not* rejected, which implies that one cannot tell if the parameter is different from zero. This does not mean that the parameter is zero, rather just that it *could* be zero. Franklin M. Fisher, "Multiple Regression in Legal Proceedings," *Columbia Law Review*, 80(4) (May 1980): 702-736 at 717-718 ("The significance level tells us only the probability of obtaining the measured coefficient value *if* the true value is zero; it does *not* give the probability that the coefficient's true value *is* zero, nor does subtracting the significance level from one hundred percent give the probability that the hypothesis is not true.") (emphasis in original). *See also* Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach* (South-Western, Cengage Learning., 5th ed., 2013) at 135, 782.

[130] Erdem 2010-13 Satellite WDT at ¶51.

[131] Erdem 2010-13 Satellite WDT at ¶67.

regression in the 2010-13 Cable Proceeding.[132] While Dr. Gray attempted to address this limitation by estimating a regression model after aggregating the satellite data to the system level, Dr. Erdem elected to estimate his regression model at the station level.

81.   As Dr. Erdem himself explains, Section 119 royalties are calculated by applying a per-subscriber, per-month fee at the station level, separately for residential and commercial subscribers. Because the royalty rates vary by year and the number of subscribers, and subscribers and time period are both used as controls in the regression, there is simply no remaining variation in royalty payments that can be analyzed. Consistent with this, Dr. Erdem admits that he is not able to find any statistically significant relationship between royalty payments and programming categories when he estimates a regression model that is similar to this mechanical relationship.[133]

82.   Despite acknowledging the formula used to calculate Section 119 royalties, Dr. Erdem proceeds to estimate a regression model that bears no resemblance to the formula. There are several important ways in which the regression model he estimates differs from the formula used to calculate Section 119 royalties. First, Dr. Erdem includes the natural logarithm of royalties, despite the fact that the true model is a mechanical, linear calculation. By his own design, this introduces bias into Dr. Erdem's model.[134] Second, Dr. Erdem's model relies on the total number of subscribers from the prior accounting period, even though he acknowledges that royalty payments are mechanically calculated based on subscriber counts in each month, with separate royalty rates applied to residential and commercial subscribers. Third, Dr. Erdem adds parameters to estimate the relationship between the natural logarithm of royalties and programming minutes by category even though there is little remaining variation in royalties to analyze after already controlling for time period and the number of subscribers. Although Dr. Erdem's model results in

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[132] Erdem 2010-13 Satellite WDT at ¶¶56-61.

[133] Erdem 2010-13 Satellite WDT at ¶72.

[134] Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach* (South-Western, Cengage Learning., 5th ed., 2013) at 86 ("Another functional form misspecification occurs when we use the level of a variable when the log of the variable is what actually shows up in the population model, or vice versa. For example, if the true model has log(*wage*) as the dependent variable but we use *wage* as the dependent variable in our regression analysis, then the estimators will be biased.").

some statistically significant parameter estimates, his estimates are simply an unreliable byproduct of a biased model.[135]

83.   It is simply not possible to estimate a reliable Waldfogel-type regression using satellite data. Aggregating the satellite data to the system level, as Dr. Gray did, results in there being too few observations, and too little variation, to calculate statistically significant relationships.   At the other extreme, one cannot estimate a station-level regression, as Dr. Erdem discusses, because all of the variation in royalty payments at the station-level is completely accounted for by the mechanical calculation of royalties based on the number and type of subscribers.

VII.   RUBINFELD AND ERDEM'S CRITIQUES OF THE CRAWFORD CABLE REGRESSION ANALYSIS REPEAT ARGUMENTS PREVIOUSLY CONSIDERED BY THE JUDGES

84.   Professor Rubinfeld and Dr. Erdem each discuss what they believe to be flaws in the Crawford cable regression analysis. However, these critiques largely repeat arguments that the Judges considered and rejected in the 2010-13 Cable Proceeding. As the Judges in the 2010-13 Cable Proceeding explained, fee regressions, such as the analysis offered by Professor Crawford, have been found to be useful in prior cable distribution proceedings.[136] The Judges concluded, on balance, that "Professor Crawford's regression analysis, especially his duplicate-minutes approach, [is] highly useful in estimating relative values in this proceeding."[137] Moreover, the Judges remarked they were "struck by the relative consistency of the results across the accepted methodologies," including Professor Crawford's regression analysis.[138]

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[135] Dr. Erdem describes the relationship captured by his parameter estimates as "artificially created." As Dr. Erdem explains, "by using the natural logarithm of royalties (as opposed to the untransformed, actual values for royalties), the perfect relationship (or correlation) between the dependent variable (royalties) and the independent variable (subscribers) is destroyed. As a result, the regression analysis "estimates" coefficients for the minute variables that supposedly "explain" the variation in the logarithm of royalties that is artificially created." Erdem 2010-13 Satellite WDT at ¶72.

[136] 2010-13 Final Cable Determination at 3557-3558.

[137] 2010-13 Final Cable Determination at 3569.

[138] 2010-13 Final Cable Determination at 3610.

A. The Judges in the Cable Proceeding previously considered the critiques repeated by Prof. Rubinfeld and Dr. Erdem

85.   The Judges' decision in the 2010-13 Cable Proceeding includes an extensive discussion of Dr. Erdem's "broad criticisms" of the Crawford regression analysis.[139] Throughout their discussion, the Judges in the Cable Proceeding explicitly rejected nearly all of Dr. Erdem's criticisms.[140] Moreover, the Judges "reject[ed] Dr. Erdem's broad argument that Waldfogel-type regressions are not useful in establishing relative value in this proceeding."[141] Despite this, Professor Rubinfeld and Dr. Erdem now repeat essentially the same criticisms.

86.   For instance, both Professor Rubinfeld and Dr. Erdem opine in this proceeding that a fee regression analysis cannot be used to estimate relative value because the royalty fees that MVPDs pay are set by statute.[142] In the 2010-13 Cable Proceeding, the Judges described a "chorus of witnesses" offering this same criticism, which Professor Rubinfeld and Dr. Erdem repeat.[143] The Judges explained that although the fees may be regulated, "the relative preferences of CSOs for different categories of programs are revealed through such a regression."[144]

87.   Similarly, although the Judges in the Cable Proceeding concluded that Professor Crawford's regression controlled for geographic effects, Professor Rubinfeld re-alleges

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[139] 2010-13 Final Cable Determination at 3557, 3559-3567.

[140] 2010-13 Final Cable Determination at 3559-3560 (rejecting Dr. Erdem's critique of the algorithm Professor Crawford used to allocate royalties to minutes of programming across categories), 3560-3561 (rejecting Dr. Erdem's allegation that Professor Crawford's analysis is simply a "volume focused" approach), 3561 (rejecting Dr. Erdem's criticism related to the "number of distant subscribers" control variable in Professor Crawford's regression), 3562 (rejecting Dr. Erdem's critiques related to alleged sensitivity in Professor Crawford's nonduplicated minutes model; rejecting Dr. Erdem's critiques related to WGNA), 3563 (rejecting Dr. Erdem's allegation that geographic factors could lead to allegedly erroneous results), 3564 (rejecting Dr. Erdem's critiques related to the subscriber control variable in Professor Crawford's regression), and 3567 (concluding that the Judges have not seen any evidence to suggest that Dr. Erdem's criticisms related to alleged "overfitting" should diminish reliance on Professor Crawford's regression analysis).

[141] 2010-13 Final Cable Determination at 3557-3558.

[142] Rubinfeld 2010-13 Satellite WDT at ¶54; Erdem 2010-13 Satellite WDT at ¶19.

[143] 2010-13 Final Cable Determination at 3575.

[144] 2010-13 Final Cable Determination at 3581.

that Professor Crawford's cable analysis potentially overstates the relative value of JSC programming by not controlling for geographic effects.[145] As the Judges explained in the Cable Proceeding, criticisms alleging that Professor Crawford's regression did not control for geographic effects "appear[] to be based on a difference of opinion as to how to account for the geographic issue rather than any error in Professor Crawford's regression analysis."[146]

88.　　Dr. Erdem also repeats his criticism of the functional form Professor Crawford utilized in his regression analysis. Specifically, Dr. Erdem alleges that Dr. Crawford's "log-linear" regression "introduces bias (in whatever it is measuring) by incorrectly specifying the relationship between royalties and subscribers."[147] Again, the Judges considered this same criticism in the 2010-13 Cable Proceeding and rejected it, explaining that "[t]he Judges find that Professor Crawford's regression is not compromised by his use of the linear form to express the number of subscribers in this control variable."[148]

89.　　In support of his criticisms, Dr. Erdem offers 23 variations on Professor Crawford's cable regression. In the first two of these variations, Dr. Erdem adjusts Professor Crawford's parameter estimates to incorporate the "common level shift" that Professor Crawford explained when responding to one of Dr. Erdem's critiques in the Cable Proceeding.[149] But even when Dr. Erdem implements this change, his revised version of Professor Crawford's regression still finds that distant broadcasts of JSC programming are more valuable than the other categories of programming on distant signals.[150] Throughout Dr. Erdem's 23 variations, he only finds that distant JSC broadcasts are relatively less valuable when he counterfactually includes non-compensable network programming when re-estimating the cable regressions. However, because CSOs pay less in royalty fees to

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[145] Rubinfeld 2010-13 Satellite WDT at ¶¶99-100; 2010-13 Final Cable Determination at 3563 ("The Judges find that Professor Crawford's regression controlled for geographic effects.").

[146] 2010-13 Final Cable Determination at 3563.

[147] Erdem 2010-13 Satellite WDT at ¶105.

[148] 2010-13 Final Cable Determination at 3564.

[149] Erdem 2010-13 Satellite WDT at ¶¶110-118; 2010-13 Final Cable Determination at 3564-3565.

[150] Erdem 2010-13 Satellite WDT at Exhibits 13 and 14.

carry distant network stations, and so much of the programming on distant signals is not compensable, this variation on Professor Crawford's model simply does not match reality.[151]

90.   Network originated programming on ABC, CBS, and NBC is not compensable under Section 111, and, as Professor Rubinfeld explained, CSOs pay less in royalty fees to carry affiliates of these networks as distant signals compared to other distant signals.[152] By including programming that is non-compensable under Section 111 in his modification of the Crawford cable regression, Dr. Erdem introduces attenuation bias into his results.[153] Highly valuable JSC content that is not compensable under Section 111 but is compensable under Section 119 includes network-originated broadcasts of the Super Bowl and NFL Playoffs, NBA Finals, NHL Stanley Cup Finals, and the NCAA college basketball tournament (March Madness).[154] By including these into his modification of the cable regression, Dr. Erdem is biasing his estimate of JSC value toward zero.

91.   In summary, nearly all of the criticisms of the Crawford cable regression offered by Professor Rubinfeld and Dr. Erdem in this proceeding were previously considered by the Judges in the 2010-13 Cable Proceeding. None of the numerous additional variations on Professor Crawford's cable regression offered by Dr. Erdem supports a conclusion that the Judges should not have relied on the regression as a measure of relative value in the 2010-13 Cable Proceeding.

> **B.   The results from Professor Crawford's cable regression are consistent with other evidence considered by the Judges in the Cable Proceeding**

92.   The Judges in the 2010-13 Cable Proceeding remarked at the strong consistency of the results reached across multiple methodologies and data sources they considered. The Judges did not allocate cable royalties based solely on any one analysis, but instead relied on Professor Crawford's regression, the Horowitz Survey, the Bortz Survey, the

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[151] Rubinfeld 2010-13 Satellite WDT at n. 62.

[152] Rubinfeld 2010-13 Satellite WDT at n. 62.

[153] William H. Greene, *Econometric Analysis* (Prentice-Hall, 5th ed., 2003) at 83-86.

[154] Trautman 2010-13 Satellite WDT at App. D, App. E.

McLaughlin "Augmented Bortz" results, and the regression analysis offered by the Canadian claimants' economist.[155] The Judges explained that they were "struck by the relative consistency of the results across the accepted methodologies."[156]

93. When relying on an econometric model, economists regularly consider whether the results of the model are consistent with other evidence, as the Judges in the Cable Proceeding did. For example, two former Federal Trade Commission economists explained that "[a]n econometric study useful for decision-making at the FTC should … [u]tilize an economic model that is consistent with the key institutional factors and the facts in the setting being modeled and that generates results that can be evaluated in the context of other evidence."[157]

94. Likewise, Professor Rubinfeld offered the following advice in a prior publication:

> Because empirical analyses often appear complex to the lay person, there may be a tendency on the part of the courts or others to separate the evaluation of the evidence resulting from these methodologies from other factual evidence. Such a separation is inadvisable. The empirical analysis of data should be combined with an analysis of nonstatistical information. As more nonstatistical information is brought to bear, the systematic empirical evidence can often answer the key questions at issue in litigation more precisely. [158]

95. In the table below, I summarize the satellite royalty allocations calculated by Dr. William Wecker and Mr. Gary Harvey based on the annual cable royalty allocations determined by the Judges in the 2010-13 Cable Proceeding.[159] Dr. Wecker and Mr. Harvey calculated these allocations by multiplying the final allocations from the 2010-13 Cable Proceeding by the ratio of the share of compensable distant *satellite* subscriber-weighted

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[155] 2010-13 Final Cable Determination at 3610.

[156] 2010-13 Final Cable Determination at 3610.

[157] David Scheffman and Mary Coleman, "FTC Perspectives on the Use of Econometric Analyses in Antitrust Cases," chapter V in *Econometrics: Legal, Practical, and Technical Issues* (J. Harkrider, ed.), American Bar Association, Antitrust Section, 2005, 115-129 at 118.

[158] Daniel L. Rubinfeld, "Quantitative Methods in Antitrust," chapter 30 in *Issues in Competition Law and Policy* (W.D. Collins, ed.), American Bar Association, Antitrust Section, 2008, 723-742 at 742.

[159] Written Direct Testimony of William E. Wecker, Ph.D. and R. Garrison Harvey, *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13)), March 22, 2019 (corrected and amended June 7, 2019) (hereinafter "Wecker and Harvey 2010-13 Satellite WDT") at Table 1.

broadcast minutes to the corresponding share of compensable distant *cable* subscriber-weighted broadcast minutes in each of the four relevant program claimant categories.[160] Dr. Wecker and Mr. Harvey also calculated the results of the Bortz[161] survey after applying the same adjustment based on the ratio of compensable subscriber-weighted minutes.[162] Additionally, SDC proposes basing the satellite allocations on cable operator survey results without adjusting for differences in subscriber-weighted minutes,[163] and so I have also included the Bortz survey results without the volume adjustment.[164]

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[160] Wecker and Harvey 2010-13 Satellite WDT at ¶¶10-22.

[161] I understand that Dr. Mathiowetz and Mr. Trautman testified that the Horowitz surveys suffer from methodological flaws that render them an invalid measure of value for purposes of this satellite proceeding. Written Rebuttal Testimony of Nancy A. Mathiowetz, Ph.D., *In Re: Distribution of Satellite Royalty Funds* (No. 14-CRB-0011-SD (2010-13) at ¶¶14-28; Trautman 2010-13 Satellite WRT at 22-27.

[162] Wecker and Harvey 2010-13 Satellite WRT at Appendix P.

[163] *See* Sanders 2010-13 Satellite WDT at 22; Erdem 2010-13 Satellite WDT at ¶¶48-50 and Exhibits 6 and 7. Notably, unlike my benchmark analysis, SDC does not attempt to account for the fact that in 2010-13, SDC programming comprised a smaller proportion of compensable distant signal programming retransmitted by satellite carriers than by cable operators (after removing shares for public television claimants and the Canadian claimants group). *See* Wecker and Harvey 2010-13 Satellite WDT at Table 6.

[164] Consistent with the approach of SDC witness John Sanders, Dr. Wecker and Mr. Harvey have removed the public television claimants and Canadian claimants group shares and rescaled the remaining shares to equal 100 percent.

**Proposed Satellite Royalty Allocation Based on 2010-13 Final Cable Determination
Compared to Re-Scaled Bortz Survey Results**

	Based on 2010-13 Final Cable Determination (Volume Adjusted)	Re-Scaled Bortz Survey Results (Volume Adjusted)	Re-Scaled Bortz Survey Results (No Volume Adjustment)
Joint Sports Claimants			
2010	36.8%	38.3%	42.8%
2011	37.7%	35.3%	38.2%
2012	45.1%	40.7%	40.2%
2013	48.6%	40.9%	40.7%
2010-13	41.8%	38.7%	40.5%
Program Suppliers			
2010	39.2%	39.6%	33.4%
2011	38.6%	45.3%	37.8%
2012	30.2%	32.7%	30.5%
2013	29.1%	33.1%	29.4%
2010-13	34.5%	37.9%	32.9%
Commercial TV			
2010	22.1%	20.6%	19.6%
2011	20.4%	17.3%	19.2%
2012	21.1%	24.0%	24.2%
2013	19.5%	23.3%	24.5%
2010-13	20.8%	21.2%	21.8%
Devotional Programs			
2010	1.8%	1.5%	4.2%
2011	3.3%	2.1%	4.7%
2012	3.6%	2.5%	5.1%
2013	2.9%	2.8%	5.4%
2010-13	2.9%	2.2%	4.8%

Sources: Wecker and Harvey 2010-13 Satellite WDT, Table 1; Wecker and Harvey 2010-13 Satellite WRT, Tables P1 and P2.

VIII. CONCLUSION
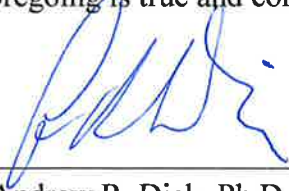
96.   I have reviewed testimony submitted by experts on behalf of Program Suppliers, Settling Devotional Claimants, and Commercial Television Claimants in the 2010-13 Satellite Proceeding. I find that much of that testimony reinforces key conclusions from the benchmark analysis I presented in my Written Direct Testimony. I find further that

testimony submitted by Program Suppliers' economic expert and industry expert simply repeats analyses that (i) were previously rejected by the Judges in the 2010-13 Cable Proceeding and (ii) lack a sound econometric foundation. Additionally, the fee-based regressions presented by Drs. Gray and Erdem demonstrate why Waldfogel-type regressions are not possible using satellite data.

97.   Based on my review of the available testimony, I reaffirm the following conclusions reached in my direct testimony:

a. The relative marketplace value framework applied by the Judges in reaching the 2010-13 cable royalty allocation is grounded in well-established economic principles.

b. Therefore, it is appropriate to rely on the resulting royalty allocation as a benchmark in the current satellite proceeding upon confirming that the Judges' four-pronged test for benchmarking is satisfied.

c. The royalty allocation from the 2010-13 Cable Proceeding satisfies the four-pronged benchmarking test: [1] the relevant parties in the cable and satellite royalty allocation proceedings are economically comparable; [2] the rights being valued in the two proceedings are economically comparable; [3] CSOs and satellite carriers face highly similar economic circumstances in large measure because they are direct competitors to one another; and [4] the rights valuation methodology is predicated on there being an adequate degree of competition to assign relative values to different program categories.

d. As a result, the 2010-13 Final Cable Determination provides a sound benchmark for the allocation of satellite royalties from distant signal retransmission, with an appropriate adjustment to account for the absence of Canadian and Public Television programming in the current proceeding.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Andrew R. Dick, Ph.D.
Dated: August 26, 2019
Washington, D.C.

Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

	)	
In re	)	
	)	
DISTRIBUTION OF	)	**NO. 14-CRB-0011-SD (2010-13)**
SATELLITE ROYALTY FUNDS	)	
	)	

Written Rebuttal Testimony of

JAMES M. TRAUTMAN

August 26, 2019

**Written Rebuttal Testimony of
JAMES M. TRAUTMAN**

I. Qualifications

I am Managing Director of Bortz Media & Sports Group, Inc. (Bortz). I have submitted

written direct testimony in this proceeding on behalf of the Joint Sports Claimants (JSC). That

testimony discussed the similarities between the Section 119 satellite compulsory license and the

Section 111 cable compulsory license, and addressed the applicability of the Copyright Royalty

Judges' (the Judges) determination in the 2010-13 cable proceeding to the current satellite

proceeding for the same years.

Appendix A to my written direct testimony sets forth my qualifications. I also submitted

written direct and rebuttal testimony in the 2010-13 Phase I cable proceeding and was qualified

in that proceeding as an expert in market research, including valuation in the cable, broadcast

and television programming industries. I have also submitted testimony in several prior

copyright royalty proceedings.

II. Introduction and Summary

I reviewed the written direct statements of the Program Suppliers ("PS") and the

Devotional Claimants ("SDC"), as well as testimony submitted by expert witnesses for those two

parties. Based on that review, my principal conclusions are as follows:

- First, the testimony of PS witness Howard Homonoff and SDC witnesses Brown,
  Sanders, Berlin and Erdem supports my conclusion that the 2010-13 Cable Final
  Determination is the most appropriate benchmark for allocating 2010-13 satellite
  royalties. All of these witnesses correctly observe that cable and satellite
  multichannel video programming distributors (MVPDs) are direct competitors,

competing for the same customers with the same product, and therefore similarly value programming.

- Second, Dr. Gray incorrectly argues that "viewing" levels are an appropriate measure of value and reflect the different premiums that the categories of programming at issue in this proceeding would capture in the open market. Industry data (including the data relied on by Mr. Homonoff) demonstrate that viewing does not equal value.

- Third, Mr. Homonoff's volume metrics are not a reliable measure of value. Indeed, Mr. Homonoff's analysis of cable network affiliate fees, while flawed for a number of reasons, demonstrates that the license fees that MVPDs pay do not correlate to volume.

- Fourth, when Mr. Homonoff's affiliate fee analysis is corrected to adjust for omissions, it demonstrates that during 2010-13, MVPDs spent approximately 41% of their affiliate fees on sports networks, which is consistent with the shares allocated by the Judges to JSC in the 2010-13 Cable Final Determination, adjusted for satellite volumes.

- Finally, if (as several SDC witnesses recommend) the Judges choose to rely on cable system operator surveys as a basis for determining relative value in the satellite distant signal marketplace, the Judges should rely on the Bortz surveys and not the Horowitz surveys.

III. Competitive Framework for Cable and Satellite MVPDs

As I explained in my Written Direct Testimony, the Judges' 2010-13 cable royalty allocations are the most appropriate benchmark for allocating the 2010-13 satellite royalties.

Written Rebuttal Testimony of James M. Trautman | 2

Cable and satellite MVPDs have similar business models, compete directly for the same customers using similar programming, and ultimately value particular types of programming similarly. Moreover, the programming carried on broadcast signals subject to Section 119 and Section 111 royalties was similar.

A number of witnesses retained by other parties testify to the similarities between satellite and cable operators and thereby support my conclusion that the 2010-13 cable royalty allocations are the most appropriate benchmark for the satellite royalties in this proceeding.[1] As this testimony suggests, value determinations that apply to cable operators (such as the Judges' cable royalty allocation) are therefore also applicable to satellite carriers.

IV. Dr. Gray

A. Viewing Does Not Equal Value

Dr. Gray asserts that viewing is the best indicator of relative value in the satellite marketplace, and that his estimate of viewing accounts for the different premiums that the various categories of programming would obtain in that marketplace.[2] This is incorrect.

Dr. Gray provides no empirical data showing that viewing equals market value. Moreover, as I discuss below, industry data relied on by another PS witness (Mr. Homonoff) directly contradicts Dr. Gray's assertion, demonstrating that neither viewing nor volume equals value. The industry data likewise demonstrate that Dr. Gray's use of the ratio of volume to

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[1] *See* 2010-13 Satellite Written Rebuttal Testimony of Andrew R. Dick, Ph.D. (March 22, 2019) (corrected June 7, 2019) ("Dick 2010-13 Satellite WRT") at 8-13 (summarizing relevant testimony of SDC, PS, and CTV witnesses).

[2] 2010-13 Satellite Amended Written Direct Testimony of Jeffrey S. Gray, Ph.D. ("Gray 2010-13 Satellite WDT") at 15.

"viewing" to calculate supposed premiums paid by MVPDs for different types of programming

grossly understates the actual premium paid by MVPDs for JSC programming.[3] Dr. Gray's

volume-to-viewing calculation shows that JSC programming receives higher "viewership" per

minute than other types of programming, but Dr. Gray ignores that MVPDs pay a much higher

premium for JSC programming than for other types of programming *with similar or greater*

levels of viewing.

Kagan compiles data for the individual programming networks distributed by both

satellite carriers and cable operators. Mr. Homonoff utilized this programming network data,

including license fee data, to evaluate actual marketplace behavior with respect to the 50 most

widely carried networks (the "Top 50"). In order to assess Dr. Gray's claims about viewing and

value, I analyzed this data to determine whether these cable networks' viewing levels correspond

to the relative value of the networks as measured by the license fees that satellite distributors and

cable operators actually paid for the right to carry the networks.

Figure 1 below summarizes network license fees per rating point (24-hour and Prime

Time) for Mr. Homonoff's Top 50 networks, using his same classification of each network as a

PSE, Sports, or News network.[4] This measure reflects the ratio of the license fees captured in the

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[3] Dr. Gray calculated his "viewing to volume" ratio for each program category by dividing the "viewing" share he calculated for each category by the category's share of programming minutes. Gray 2010-13 Satellite WDT at ¶¶ 71, 72. Dr. Gray asserts that "[t]he ratios greater than one for Program Suppliers and JSC reflect higher valuation premiums for these two categories of programming." Gray 2010-13 Satellite WDT at ¶72.

[4] Mr. Homonoff classified each of the top 50 most widely distributed networks as belonging to a single program category – "PSE" (Program Suppliers), Sports, or News – based on his assessment of the predominant programming on those networks. *See* 2010-13 Satellite Written Direct Statement of Howard B. Homonoff (March 22, 2019) (corrected June 7, 2019) ("Homonoff 2010-13 Satellite WDT") at ¶ 40. As I discuss below, characterizing entire networks

marketplace by each network to the average viewing level achieved by that network (as

measured by its average audience rating). The data demonstrate that viewing does not equal

value. Rather, during the period from 2010-13 the Sports networks in Mr. Homonoff's sample

secured license fees that were 6.5 to 8.3 times higher relative to the audience they generated than

did Mr. Homonoff's PSE networks. (See Appendix A for additional detail on license fee per

rating point by network type and by individual network.)

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as a single program category has significant limitations, given that networks often carry more
than one program type.
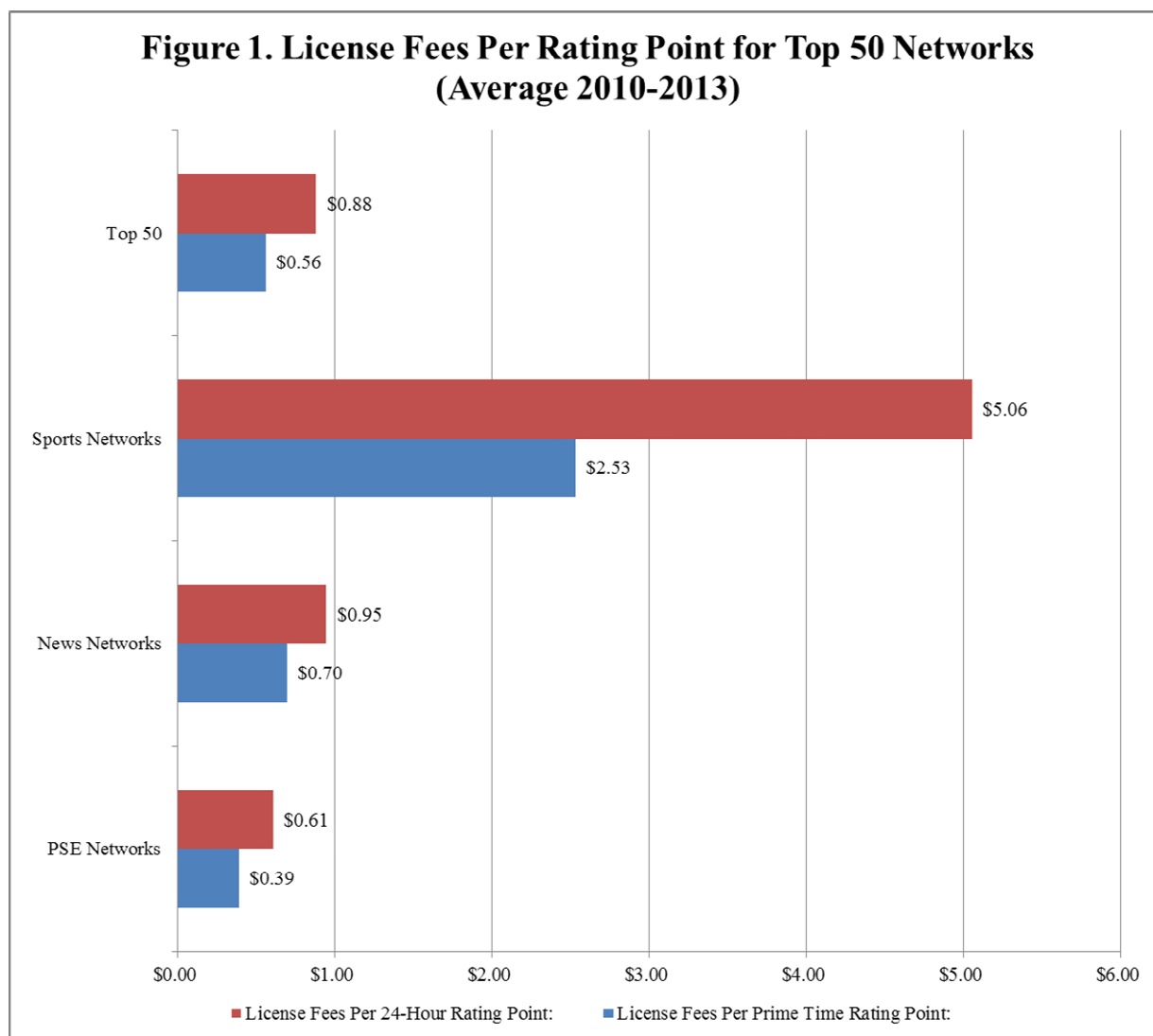
Figure 1. License Fees Per Rating Point for Top 50 Networks (Average 2010-2013)

Sources: Homonoff Exhibit 4; Nielsen ratings data as reported by Kagan, a media research group within S&P Global Market Intelligence.

As discussed later in my testimony, the "Top 50" networks that Mr. Homonoff analyzed are an unrepresentative subset drawn from a much larger dataset containing 246 advertiser-supported cable networks, and his classification of those networks as belonging to a single programming type has important limitations. I therefore also examined the fees-to-ratings ratios for each individual "Top 50" network, as well as for the 196 other networks. This expanded

analysis shows that there is an even wider disparity between viewing levels and marketplace value than suggested by Figure 1 above. Specifically, Figure 2 below shows that the value per 24 hour rating point among the Top 50 networks ranges from a high of $███ for the sports network ESPN to as little as $███ for Hallmark Channel. Figure 3 shows the range of value per prime time rating point, with ESPN again the highest at $███, compared with the lowest of the Top 50 networks (Hallmark Channel) at only $███. (See Appendix A for additional detail.) Appendix A also shows that, when expanded to include all 246 networks, the value per rating point variation is even larger, and it is the regional sports network MSG+ that achieves the highest ratio of fees-to-ratings, at $███ per prime time rating point, compared with just $███ for Hallmark Movies & Mysteries.
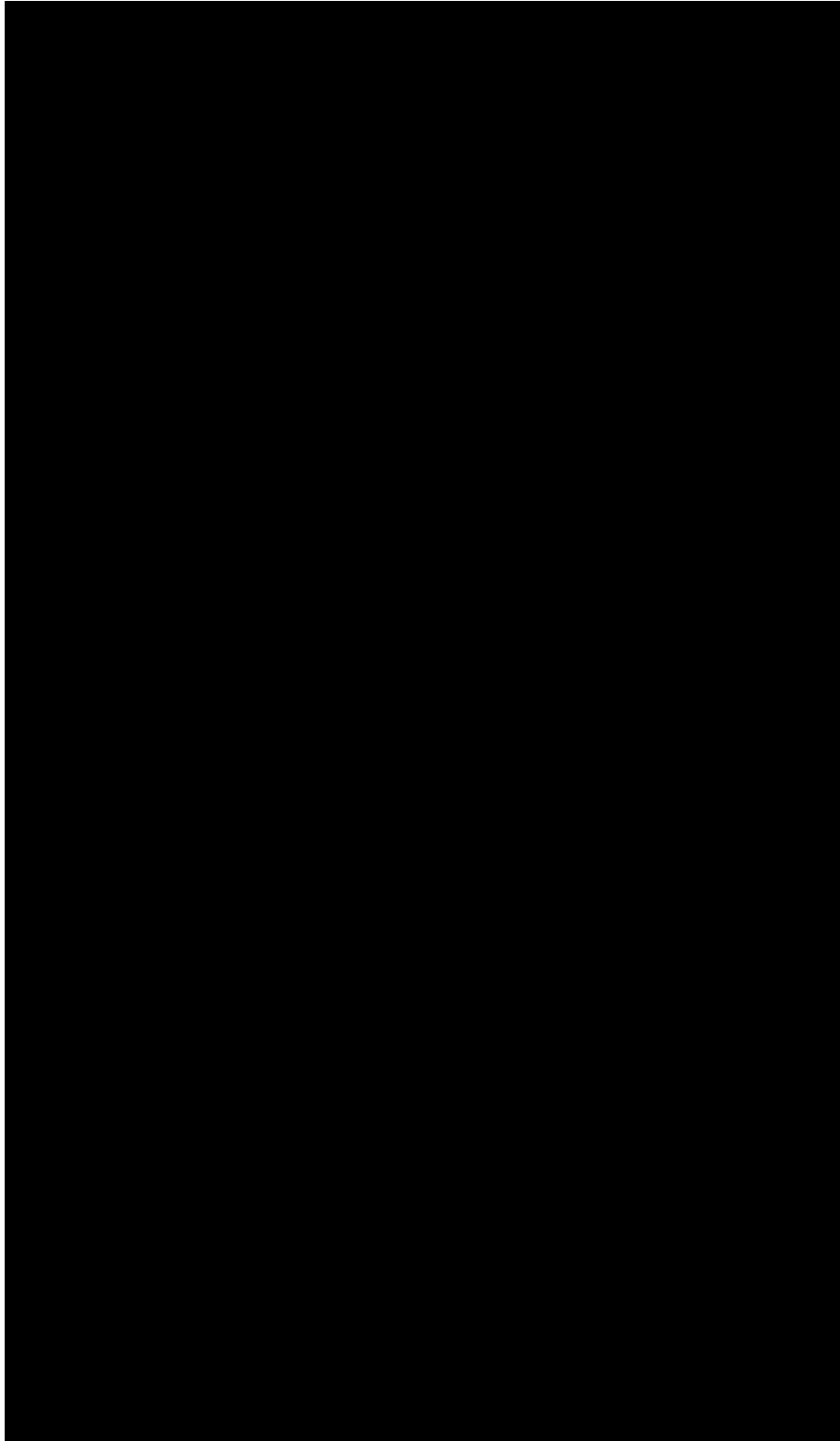
[2]

Sources: Homonoff Exhibit 4; Nielsen ratings data as reported by Kagan, a media research group within S&P Global Market Intelligence.
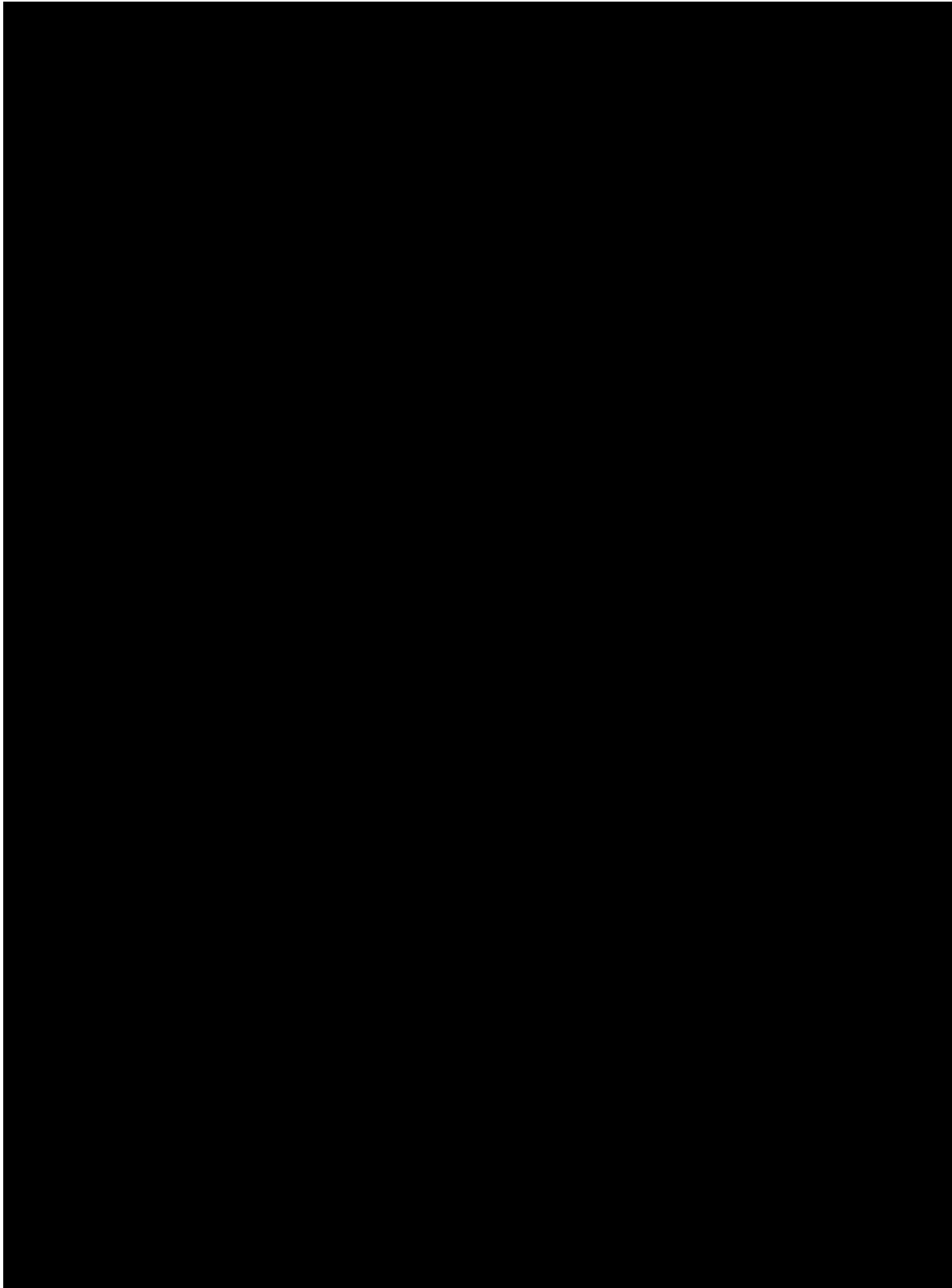
Sources: Homonoff Exhibit 4; Nielsen ratings data as reported by Kagan, a media research group within S&P
Global Market Intelligence.

The Homonoff/Kagan data is not the only industry data demonstrating that viewing does not equal value in the satellite and cable marketplace. In the 2010-13 Cable Proceeding, both JSC and CTV witnesses submitted analyses showing that viewing did not equate to value. JSC witness Dr. Mark Israel completed a cable network content analysis demonstrating that the top 25 programming networks spent an average of 9.6 times more per viewing hour on JSC programming than they did on non-JSC programming.[5]

Table 1. Cable Content Analysis, Top 25 Cable Networks, 2010-13

Category	Total Programming Hours [A]	Total HHVH (000s)[B]	Programming Expenditures (Millions)[C]	Expenditures Per Hour [D]=[C]/[A]	Expenditures Per Viewing Hour [E]=[C]/[B]
JSC	9,274	15,164,369	$12,525	$1,350,518	$0.826
Non-JSC	866,726	496,492,970	$42,702	$49,268	$0.086
JSC/Non-JSC	0.01	0.03	0.29	27.41	9.60
JSC % of Total	1.06%	2.96%	22.68%		

Source: Israel 2010-13 Cable WDT at ¶ 47.

In the same proceeding, CTV witness Dr. Gregory Crawford provided data showing the much higher license fees for sports networks relative to their viewing levels, and he observed that "the difference in the amount of money paid by cable systems to networks providing sports versus non-sports content for the same level of viewership is remarkable."[6]

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[5] 2010-13 Cable Written Direct Testimony of Dr. Mark Israel, JSC Ex. 4 ("Israel 2010-13 Cable WDT") at ¶ 47. The Judges' 2010-13 Cable Final Determination cited Dr. Israel's analysis as evidence that "cable operators will pay substantially more for certain types of programming than for other programming with equal or higher viewership." 2010-13 Cable Final Determination at 3600 n. 168.

[6] JSC Ex. 10 (2010-13 Cable Written Rebuttal Testimony of Dr. Gregory S. Crawford) at Figure 1 and ¶ 36.

Figure 4. Average Affiliate Fees Much Higher for Sports Content Despite Similar Levels of Average 24-Hour Viewership
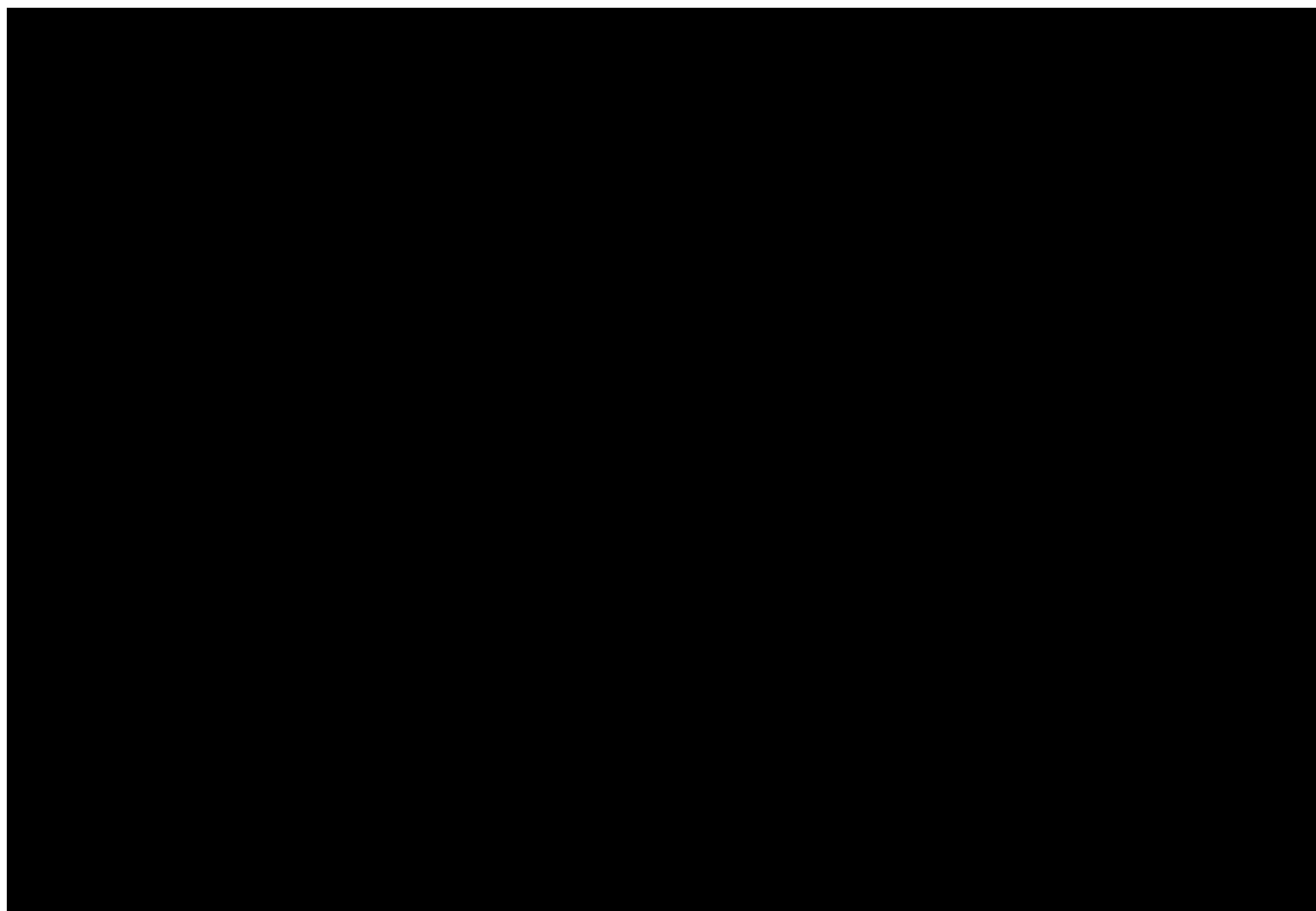
As an example, Dr. Crawford noted that the license fee for the regional sports network Comcast SportsNet Chicago was more than 40 times higher than the license fee for the Hallmark Channel, even though the Hallmark Channel produced a slightly higher average audience rating.[7]

In short, Dr. Gray's assertion that relative viewing measures relative programming value is simply wrong, and is directly contradicted by outcomes reflected in actual marketplace

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[7] Crawford 2010-13 Cable WRT at ¶ 36.

transactions. Moreover, Dr. Gray's use of the ratio of volume to viewing to calculate premiums paid by MVPDs for different types of programming grossly understates the actual premium paid by MVPDs for JSC programming.

B.   WGNA

As discussed in my direct testimony, the superstation WGN America (WGNA) accounted for more than 72 percent of Section 119 satellite royalties from 2010-13.[8] Moreover, WGNA is unique among the distant signals re-transmitted by satellite carriers in that a substantial portion of the station's programming (predominantly Program Suppliers' content) is not compensable in this proceeding. Dr. Gray: (1) suggests that satellite carriers may have carried WGNA primarily for its non-compensable content; and (2) notes that WGNA was not identified by satellite carrier DISH Network as a "most popular" channel and that it was bundled with channels identified as "most popular."[9]

With respect to the first issue, Dr. Gray is incorrect in suggesting that non-compensable content drove satellite carriage of WGNA. It is my experience that WGNA's live professional sports programming (all of which is compensable in this proceeding) was the primary driver of its carriage in 2010-13 for both satellite carriers and cable operators. My experience in this regard is consistent with the testimony of JSC witnesses Daniel Hartman and David Shull, both

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[8] 2010-13 Satellite Written Direct Testimony of James M. Trautman (March 22, 2019) (corrected June 7, 2019) ("Trautman 2010-13 Satellite WDT") at 15.

[9] Gray 2010-13 Satellite WDT at 11.

of whom were executives responsible for programming decisions at the two principal satellite carriers that paid over 99 percent of the Section 119 royalties during 2010-13.[10]

Second, Dr. Gray's attempt to equate "popularity" with value is misplaced, as shown in the above analysis demonstrating that viewing levels do not equate to affiliate fees. The mere fact that DISH might not have labeled WGNA as one of its "most popular" channels says nothing about the value that DISH placed on WGNA. Rather, it makes no sense that DISH would have made WGNA available to such a large number of its subscribers (and in so doing incurred expenses of more than $25 million annually from 2010-13) if it had not believed that WGNA was important to its efforts to attract and retain subscribers. David Shull, who was responsible for DISH programming decisions during 2010-13, has testified that WGNA was the most important Section 119 signal Dish carried during the 2010-13 period, and that the sports on WGNA was the reason DISH paid to carry WGNA.[11] Daniel Hartman, who was responsible for programming decisions at DirecTV during 2010-13, testified that DirecTV valued WGNA for its live sports programming, and that Dr. Gray is incorrect to suggest that carrying WGNA was not important to MVPDs.[12]

The examples of "popularity" used by Dr. Gray also disprove his suggestion that WGNA was not valued by MVPDs and that viewing correlates to value. For example, MVPDs were willing to pay more for WGNA (which Gray deems not "most popular") than for Bravo (which Gray deems "most popular"). Likewise, MVPDs paid more for the NFL Network than for either

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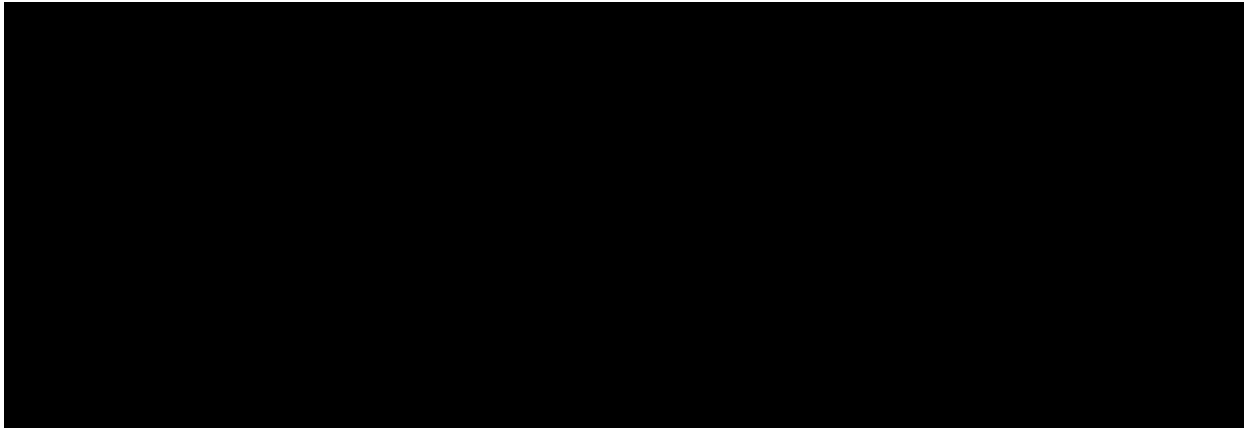
[10] Hartman 2010-13 Satellite WRT at ¶¶ 12, 13; Hartman 2010-13 Satellite WDT at ¶ 16; Shull 2010-13 Satellite WRT at ¶ 12; Shull 2010-13 Satellite WDT at ¶¶ 26, 27.

[11] Shull 2010-13 Satellite WRT at ¶ 12.

[12] Hartman 2010-13 Satellite WRT at ¶¶ 12, 13.

WGNA or Bravo, even though the NFL Network's total day viewing levels were lower than WGNA's and Bravo's.

Table 2. Audience Ratings Range for Selected Networks, 2010-13

V.   Mr. Homonoff's Analysis of Cable Network Data

Mr. Homonoff purports to assess the relative marketplace value of cable network programming by evaluating cable network data compiled by Kagan. As discussed in greater detail below, his analysis is deeply flawed – Mr. Homonoff relies on invalid metrics and presents misleading and unrepresentative data and calculations. As a result, Mr. Homonoff's conclusions regarding the implications of the cable network data he analyzes are incorrect. Nevertheless, when properly evaluated, the underlying data on which Mr. Homonoff relied shows that license fees do not correspond to programming volume, and that Sports networks accounted for 41 percent of cable network license fees from 2010-13.

In evaluating selected cable networks, Mr. Homonoff presents three comparisons: (1) the total number of PS, Sports, and News networks[13] within the top 50 most widely distributed networks; (2) the total minutes of programming by category contained on these same 50 networks; and (3) the aggregate license fees attributable to PS, Sports, and News networks among those 50 networks.

Volume measures. The first two measures presented by Mr. Homonoff are merely indicators of the quantity or volume of programming within a particular programming category and do not measure the relative market value of the programming considered. Mr. Homonoff's reliance on volume metrics is surprising, given that an examination of the underlying dataset upon which Mr. Homonoff relied demonstrates that volume does not equal value. Essentially all of the 50 cable networks selected by Mr. Homonoff offered identical volumes of programming from 2010-13 (i.e., 24 hours per day for 365 days, or 8,760 annual programming hours) – yet the amounts paid by MVPDs for the right to distribute those networks ranged from as low as $██ per subscriber per month for POP to as high as $███ per subscriber per month for ESPN.[14] In other words, on a per subscriber per month basis, MVPDs have made the actual marketplace decision that the average hour of ESPN programming is worth 246 times more than the average

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[13] As noted above, Mr. Homonoff classified each of the top 50 most widely distributed networks as belonging to one of three program categories – "PSE" (Program Suppliers), Sports, or News – based on his assessment of the predominant programming on those networks.

[14] One of the Homonoff networks (HLN) did not charge a license fee from 2010-13. For purposes of comparison, I have excluded this network because it is co-owned and co-marketed as a "companion" to CNN and therefore it is uncertain what its license fee value would be if sold independently.

hour of programming on POP.[15] Figure 5 below sets forth the range of license fees per-

subscriber, per-month for the 50 networks in Mr. Homonoff's sample.

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[15] This comparison actually understates the range of value per hour for individual programs, because the most valuable hours on ESPN (e.g., live professional or college team sports telecasts) would be thousands of times more valuable than the least valuable hours on POP (assuming the least valuable hours on POP have a value to satellite distributors that is greater than zero, which they likely do not).
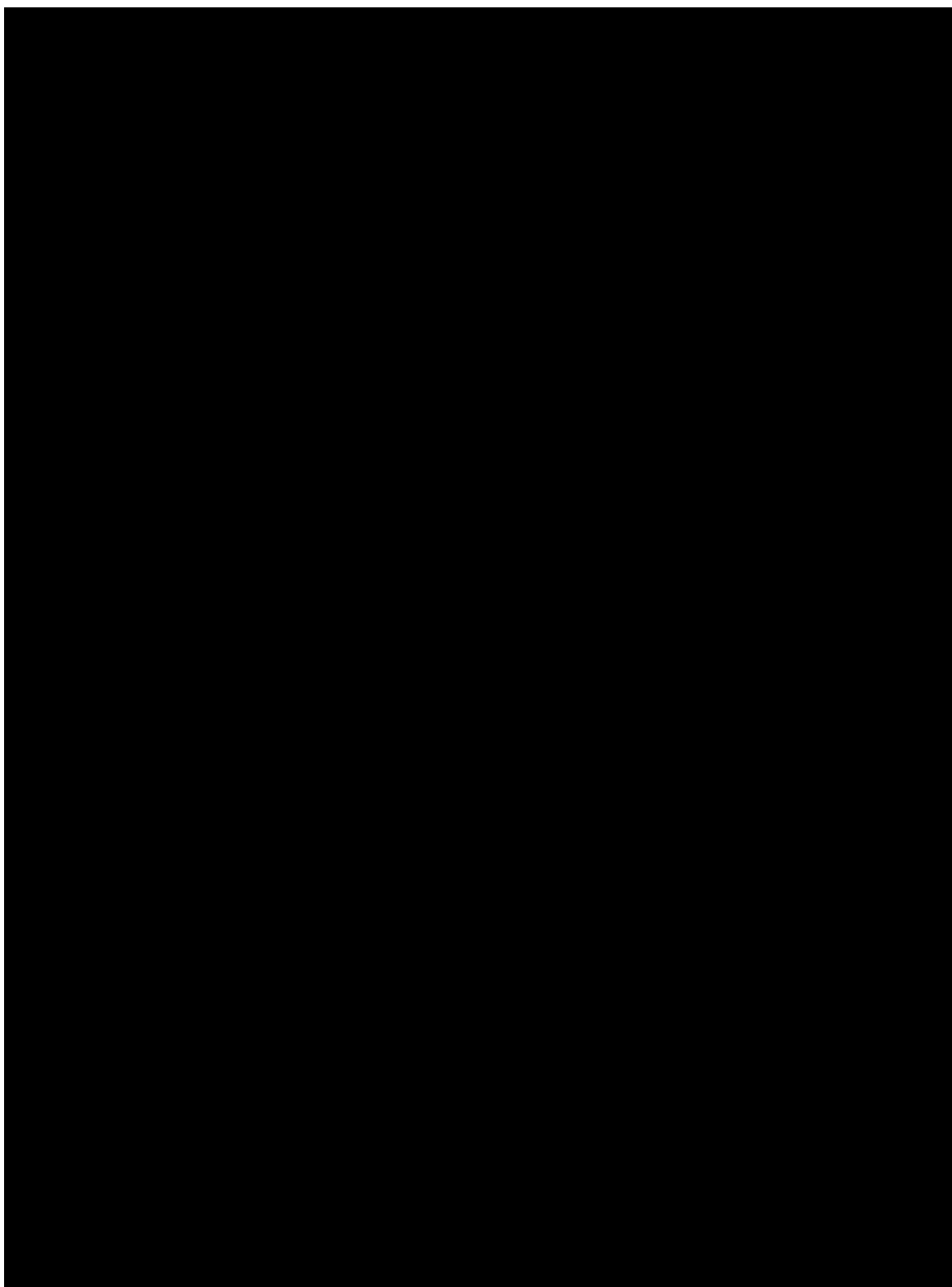
Source: Homonoff Exhibit 4.

In short, just as the data presented in Section IV above show that viewing does not equate to value in the open market, that same industry data demonstrates that the volume metrics presented by Mr. Homonoff provide no indication whatsoever of relative market value.

Affiliate fee measures. The third comparison presented by Mr. Homonoff sets forth the aggregate license fees paid by satellite and cable operators to programming networks, grouped by the programming category most closely associated with the network. If properly performed, such an analysis can be useful as a broad indicator of relative market values in the satellite and cable programming marketplace. However, Mr. Homonoff's version of the analysis is flawed in several respects, leading to incorrect calculations and misleading results. I review the flaws in Mr. Homonoff's analysis below, and provide an alternative calculation that more accurately and comprehensively reflects relative value in the cable network marketplace.

To begin, Mr. Homonoff states that "the relative importance and value to the distributors of programming carried on distant signals can effectively be understood by examining *the entirety of the cable network line-ups assembled by MVPDs*."[16] Consistent with this fundamental notion, Mr. Homonoff obtained a comprehensive data set consisting of 246 advertiser-supported cable networks.[17] Yet, despite having access to the entire data set, Mr. Homonoff limited his

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[16] Homonoff 2010-13 Satellite WDT at ¶ 37 (emphasis added).

[17] Mr. Homonoff asserts that the complete data set incorporated 264 networks (Homonoff 2010-13 Satellite WDT at footnote 6). My review of the information produced by Mr. Homonoff identified 265 networks. However, this data set included four premium networks, three home shopping networks and 12 broadcast networks which should be excluded from consideration, yielding 246 advertiser-supported basic networks.

analysis to a subset of just 50 networks.[18]   Further, Mr. Homonoff fails to address the fact that

the programming category allocations for the license fees paid to the nearly 200 networks he

excluded were far different than for those paid to Mr. Homonoff's subset. As a result, Mr.

Homonoff's license fee analysis, as presented, is not representative of the overall relative value

allocation of license fees paid by MVPDs in assembling the entirety of their channel line-ups.

The primary flaw in Mr. Homonoff's approach is that it excludes regional sports

networks (RSNs). These networks are carried by both DirecTV and DISH Network, with one or

more such networks available to essentially all satellite subscribers and included in packages

subscribed to by a large majority of satellite customers. Equally important, RSNs typically have

license fees that are among the very highest of any cable network – usually second only to ESPN

among all cable networks carried by an MVPD. In other words, they are among the most

important and valuable networks offered to individual subscribers by any MVPD.[19] In the

aggregate, these networks accounted for almost $4 billion per year in MVPD license fees, or

more than 12 percent of all license fees paid to advertiser-supported programming networks by

MVPDs from 2010-13.

Given these considerations, it is inappropriate to exclude RSNs when evaluating the

distribution of license fees paid to programming networks. Moreover, it is relatively

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[18] Mr. Homonoff also asserts, incorrectly, that his so-called "Top 50" networks accounted for 75 percent of all network license fees. Homonoff 2010-13 Satellite WDT at ¶ 38. Based upon a review of data underlying Mr. Homonoff's testimony, as produced in discovery, these networks accounted for only 67 percent of the total license fees attributable to the 246 advertiser-supported networks.

[19] Mr. Homonoff attempts to defend the exclusion of RSNs largely on the basis of their regional nature. However, all but one of the Section 119 distant signals (WGNA) are carried on a regional basis.

straightforward (using Kagan's genre descriptions as a starting point) to determine the appropriate programming category for a given network, and then to calculate the distribution of license fees among those categories for all 246 of the networks. As shown below in Table 3, during 2010-13, satellite carriers and cable operators paid a total of $126.2 billion (or an average of $31.6 billion per year) for the rights to carry the 246 advertiser-supported cable networks included in Mr. Homonoff's data set. Of this amount, nearly $52 billion – or 41 percent – was paid to carry Sports networks:

Table 3. Distribution of Cable Network License Fee Revenues by Network Type, 2010-13*

Network Type	2010	2011	2012	2013	Total: 2010-13
Sports Networks**	$11,351,114	$12,327,607	$13,235,217	$14,834,267	$51,748,205
PS Networks	14,009,442	15,076,326	16,180,804	17,678,767	62,945,339
News Networks	2,543,627	2,785,326	2,996,413	3,200,388	11,525,754
Total	$27,904,183	$30,189,259	$32,412,434	$35,713,422	$126,219,298
Sports Network Percent of Industry Total	40.7%	40.8%	40.8%	41.5%	41.0%

*Includes all 246 advertiser-supported cable networks referenced in Mr. Homonoff's testimony.
**Includes only networks that feature live professional/college team sports.

While the comparison shown above in Table 3 corrects for the errors in Mr. Homonoff's analysis and provides some indication of relative marketplace value, it is limited as a tool for determining relative value in the distant signal marketplace because it reflects entire networks that may contain more than one programming type. For example, Dr. Israel's content analysis in the 2010-13 cable proceeding showed that cable networks TBS and TNT spent approximately 45 percent of their aggregate programming budgets on JSC sports programming – yet Mr. Homonoff's analysis (and Table 5 above) attributes all of the license fees for these networks to Program Suppliers.

Summary and conclusions. Mr. Homonoff's analysis of cable network data is seriously flawed. The volume metrics he presented do not equate to relative market value. Moreover, Mr.

Homonoff's analysis of network license fees relied on incomplete and unrepresentative data.

Correcting Mr. Homonoff's license fee analysis provides an indicator of relative value, and

demonstrates that Sports networks accounted for 41 percent of cable network license fees from

2010-13.

VI.   Cable System Operator (CSO) Surveys

SDC submitted testimony from several expert witnesses who advocate allocating satellite

royalties using the results of the CSO surveys presented in the 2010-13 cable proceeding (i.e., the

Bortz and Horowitz surveys). These witnesses include: Dr. William Brown, John Sanders, Toby

Berlin and Erkan Erdem, Ph.D.

I agree with these witnesses that properly designed and executed CSO surveys provide

strong evidence of relative marketplace value. That said, the Judges have already made a

determination regarding the relative market value of distant signal programming in the 2010-13

cable proceeding that incorporated their consideration of CSO survey evidence. It therefore

makes sense to use that final determination as the benchmark in this proceeding for establishing

relative market value.[20]

If, however, the Judges accept the SDC witnesses' recommendation to rely on cable

operator surveys in lieu of their final determination, I believe they should rely on the Bortz

surveys and not the Horowitz surveys.

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[20] I note that SDC's approach of using cable operator surveys to allocate satellite shares does not account for the fact that SDC's share of distant programming volume on satellite (approximately 1.6%) was less than SDC's share of distant programming on cable (approximately 4.0%). *See* 2010-13 Satellite Written Direct Testimony of William E. Wecker, Ph.D. and R. Garrison Harvey (March 22, 2019) (corrected and amended June 7, 2019) ("Wecker 2010-13 Satellite WDT") at Table 6.

The Judges heard extensive testimony addressing the Bortz and Horowitz surveys in the 2010-13 cable proceeding, and they summarized that testimony at length in their 2010-13 Cable Final Determination.[21] As the Judges recognized, prior allocation determinations had "relied heavily and almost exclusively" on the Bortz surveys.[22] Indeed, the Bortz surveys estimate relative market value using the well-established constant sum methodology, and they have been continually refined and improved over a 30 year period.

Nonetheless, the Judges in the 2010-13 cable proceeding ultimately decided to place less weight on the Bortz surveys than on the Horowitz surveys. The Judges' 2010-13 Cable Final Determination described a number of criticisms that parties had raised against the Bortz surveys, and they identified two particular criticisms as the basis for their decision to accord less weight to Bortz. The Judges' primary criticism of the Bortz surveys was that they potentially undervalued PTV and CCG programming due to Bortz's long-standing practice of excluding[23] from its sample systems that carried only PTV or CCG programming. The Judges also noted that they believed one of Bortz's warm-up questions could potentially have created confusion in the respondents' estimation of relative value.

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[21] 2010-13 Cable Final Determination at 3582-91.

[22] 2010-13 Cable Final Determination at 3591.

[23] The Bortz and Horowitz surveys employ a constant-sum methodology that requires responding cable systems to allocate 100% of relative value among the different categories of distant signal programming they carried. Some systems carry only PTV or only CCG programming, and therefore the respondents only option would be to assign 100% of value to that single category, assuming they understood and followed the survey instructions. Asking respondents to assign relative value to a single category could confuse respondents, and as I explain below, it is also unnecessary because the same result can be achieved by mathematically adjusting the survey results.

With respect to the Judges' primary concern with Bortz, they stated that "particularly [because of] the acknowledged systematic bias against PTV and CCG programming, the Judges accord relatively less weight to the 'Augmented' Bortz Survey."[24] Importantly, that concern is simply not an issue in this satellite allocation proceeding. PTV and CCG programming is not carried under Section 119 and therefore is not an issue here. As SDC witness Dr. Erkan Erdam testified, the Judges' concern about PTV and CCG programming has been "eliminated" for purposes of this proceeding.[25]

I also respectfully disagree that this criticism merited according less weight to the Bortz surveys than the Horowitz surveys in the 2010-13 cable proceeding. Although Bortz did not survey cable systems that carried only PTV or only CCG signals, the "McLaughlin augmentation" mathematically reaches the same result as if Bortz had surveyed those systems.[26] And although Horowitz did survey systems that carried only PTV or only CCG signals, most of Horowitz's PTV-only respondents allocated less than 100% to PTV, even though PTV was the only distant signal those systems carried.[27] In calculating the bottom line results that Horowitz presented in the 2010-13 cable proceeding, Program Suppliers' expert Dr. Frankel

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[24] 2010-13 Cable Final Determination at 3591.

[25] 2010-13 Satellite Amended Written Direct Testimony of Erkan Erdem, Ph.D. ("Erdem 2010-13 Satellite WDT") at ¶ 46.

[26] *See* JSC Ex. 21, 2010-13 Cable Written Rebuttal Testimony of James M. Trautman (September 15, 2017) (corrected October 5, 2017) at 34-35.

[27] JSC Ex. 21 (Trautman 2010-13 Cable WRT) at 36-37. As noted above, respondents may have been confused by the question in these cases, since it makes little sense to ask for an "allocation" of relative value when there is only one category.

mathematically adjusted those PTV-only responses to equal 100%, thereby reaching essentially[28]

the same result as if Horowitz had simply excluded those systems as Bortz did and then applied

the McLaughlin augmentation.[29]

The Judges second concern with the Bortz surveys was that they added a warm-up

question that asked survey respondents to rank program categories by how expensive it would

have been for the CSO to acquire them. The Judges concluded that the "Bortz Survey muddled

the concepts of cost and value by means of its warm-up question" and that "[t]his may have

injected some confusion into the respondents' estimation of relative value."[30]

I respectfully disagree with this criticism, as well. There was no evidence of confusion in

the Bortz surveys. In my experience managing the surveys and listening to live Bortz survey

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[28] *See* JSC Ex. 21 (Trautman 2010-13 Cable WRT) at 42. While Dr. Frankel's adjustment of the Horowitz results mirrored the McLaughlin augmentation, the McLaughlin augmentation assures that an appropriate weight is applied to the PTV-only (and Canadian-only) systems by attributing weights to them that are consistent with the strata distribution of these systems as well as the overall survey response rates. The Horowitz/Frankel methodology, on the other hand, relied on the actual response rates achieved by Horowitz among these systems and thereby over-weighted the PTV-only Systems by an average of approximately one percentage point per year.

[29] While Horowitz's treatment of PTV-only systems ultimately resulted in results similar to what it would have achieved had it excluded those systems and applied the "McLaughlin augmentation," the Horowitz surveys also contained a significant flaw related to PTV programming that the Judges did not discuss in their 2010-13 Cable Final Determination. As I testified in the cable proceeding, the Horowitz survey responses suggest that in 2012 and 2013 Horowitz erroneously asked cable systems to value programming on more than 400 PTV multicast signals that were exempt from royalties and should not have been included in the survey. *See* JSC Ex. 21 (Trautman 2010-13 Cable WRT) at 43-45. In other words, of the 244 Horowitz CSO respondents that carried PTV distant signals in 2010-13, 104 (43%) may have been asked to value at least one PTV multicast distant signal for which they paid no royalty. While the underlying Horowitz data produced in document discovery did not make clear how many systems were asked to value exempt PTV signals, the data did reveal that at least some systems allocated value to exempt PTV signals. When questioned about this issue, Mr. Horowitz himself did not deny that his interviewers asked respondents to value exempt distant multicast signals in 2012 and 2013, and he testified only that he did not know whether respondents had been asked to value such signals. 2010-13 Cable Tr. at 4234 (Horowitz).

[30] 2010-13 Cable Final Determination at 3590.

interviews during 2010-13, I did not see any evidence of confusion on the part of respondents.

And as Dr. Mathiowetz testified, the data themselves do not reflect confusion on the part of

respondents, either.[31] Indeed, the 2004-05 version of the Bortz surveys[32] did not include the

expense warm-up question, and yet the results of the 2004-05 and 2010-13 Bortz surveys are

highly consistent, as reflected in Figure 6 below.

Figure 6. Average Cable Operator Allocation of Value by Distant Signal Program Type, 2010-13 and 2004-05
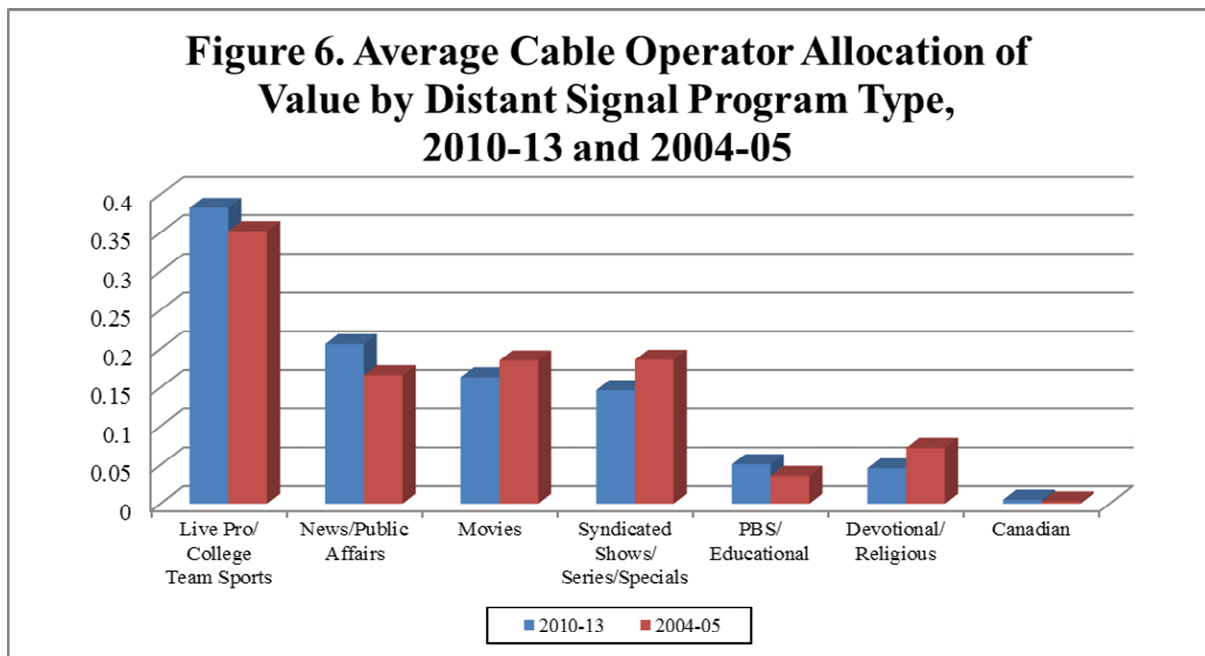
Source: Trautman 2010-13 Cable WDT at 4.

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[31] Mathiowetz 2010-13 Satellite WRT at ¶ 12.

[32] See JSC Ex. 23, Cable Operator Valuation of Distant Signal Non-Network Programming: 2004-05, Docket No. 2007-3 CRB CD 2004-2005 (June 1, 2009); see also JSC Ex. 22, Testimony of James Trautman, Docket No. 2007-3 CRB CD 2004-2005 (December 11, 2009).

The Judges' 2010-13 Cable Final Determination also discussed a number of criticisms raised against the Horowitz surveys.[33] However, I believe the flaws in those surveys were more detrimental than the Judges concluded.

One of the Horowitz survey's most significant flaws[34] was that it provided misleading examples of programming to the respondents. The Judges recognized that "Horowitz may have introduced bias by providing program examples for some of the program categories,"[35] but I disagree with the Judges conclusion that Horowitz's examples were "not likely to skew significantly results in any of the established categories."[36]

Unlike the 2010-13 and all prior Bortz surveys, the 2010-13 Horowitz surveys provided supposed examples and/or "such as" descriptions of programming included in some (but not all) of the program types for which they sought respondent valuations. While it is my view that program examples should not be used in the Bortz and Horowitz surveys given the risk that even accurate examples can bias respondents,[37] if program examples are used, it is essential that such examples accurately reflect the compensable distant signal programming actually carried by each

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[33] 2010-13 Cable Final Determination at 3586-91.

[34] I note that Horowitz's addition of an "Other Sports" category was also a fundamental problem. However, the Judges recognized that adding the "Other Sports" category created value where none existed, and accordingly they reallocated the "Other Sports" shares in Horowitz to the other program categories. 2010-13 Cable Final Determination at 3591.

[35] 2010-13 Cable Final Determination at 3590.

[36] 2010-13 Cable Final Determination at 3591.

[37] See JSC Ex. 21 (Trautman 2010-13 Cable WRT) at 19, n.13; JSC Ex. 16 (Mathiowetz 2010-13 Cable WRT) at ¶ 34; Mathiowetz 2010-13 Satellite WRT at ¶ 19.

respondent. Indeed, PS's own marketing research expert testified in the 2010-13 cable proceeding that using incorrect examples would bias the surveys.[38]

As detailed in my written testimony, the examples Horowitz used for PS programming were highly misleading and injected fundamental flaws into the survey.[39] For instance, nearly 30 percent of the systems responding to the 2010-13 Horowitz surveys carried WGNA as their only distant signal, and most of the supposed examples of PS programming that Horowitz provided to those systems were either not PS programs at all, not actually carried on WGNA on a compensable basis, or were almost entirely non-compensable. Horowitz also read those misleading examples to the respondents a total of four times throughout the interview.

The bias towards PS content that those examples created is evident in the survey results. As discussed more fully below, in contrast to Horowitz's use of misleading examples, Bortz provided its WGNA-only respondents with a written description of the compensable programs that WGNA *actually televised in each year*. Tellingly, Horowitz WGNA-only respondents allocated an average of 28.2% to Syndicated Series – nearly double the 15.7% average allocation among Bortz WGN-only respondents. Horowitz WGNA-only respondents also allocated an average of 18.1% to Movies, compared with a 14.5% average allocation from Bortz WGN-only respondents.

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[38] 2010-13 Cable Tr. 3344-46 (Steckel). In fact, when asked whether it would be inappropriate "to tell respondents a program was an example of Program Suppliers' programming if it was actually in a different category" (as Horowitz did with multiple examples), Dr. Steckel remarked that "that would be pretty bad." *Id*. at 3346.

[39] JSC Ex. 21 (Trautman Cable WRT) at 18-27.

Another flaw in the Horowitz surveys was their failure to identify compensable programming on WGNA. The Judges concluded that "Horowitz also addressed the [compensable programming] issue . . . but with less specificity than Bortz achieved in the 2010-13 survey for WGNA-only systems."[40] I disagree that Horowitz addressed the non-compensable programming issue in any meaningful way.

WGNA was the most widely carried distant signal during the years 2010-13 and generated approximately 75 percent of the Section 111 fees paid by CSOs that retransmitted distant signals during 2010-13. Approximately 80 percent of Horowitz respondents and 86 percent of Bortz respondents carried WGNA during 2010-13 on a distant signal basis. However, the majority of the programming on WGNA during 2010-13 is not compensable in these proceedings because it did not air simultaneously on WGN Chicago.[41]

As noted above, the 2010-13 Bortz surveys addressed the WGNA program compensability issue for WGNA-only systems by providing them with a written description of the compensable programs that WGNA actually televised in each year. In contrast, the Horowitz surveys merely instructed respondents not to assign any value to programs "substituted for WGN's blacked out programming." Yet it is unlikely that even a knowledgeable cable industry executive would know which programs on WGNA had been substituted for other programs on a local TV station (WGN Chicago), because the presence and identity of substituted programming on WGNA had no bearing on the amount of royalties a cable system had to pay to carry WGNA.

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[40] 2010-13 Cable Final Determination at 3590.

[41] All of JSC's and CTV's programming on WGNA is compensable, while (depending on the year) 92-98 percent of PS programming and approximately 90 percent of SDC programming is *non-compensable*.

This instruction therefore served either to accomplish nothing or, if anything, to confuse respondents by making them uncertain as to which WGNA programming they should and should not value. Horowitz's use of misleading examples that included non-compensable programming on WGNA further exacerbated that problem.

VII.   Conclusions

Experts on behalf of PS and SDC provide further support for the conclusion that cable and satellite MVPDs have similar business models, compete directly for the same customers using similar programming, and ultimately value particular types of programming similarly. Thus, the Judges' final determination in the 2010-13 cable proceeding is the best benchmark for allocating the 2010-13 satellite royalties. Furthermore, Dr. Gray's "viewing" study and Mr. Homonoff's volume measures are flawed and contradictory. Dr. Gray asserts that viewing is a measure of relative marketplace value, but the actual marketplace data relied on by Mr. Homonoff as well as other data demonstrate that neither viewing nor volume equal value; Dr. Gray does not present any empirical data to support the theory that his definition of viewing equals value. When properly evaluated, Mr. Homonoff's data on network affiliate fees show that MVPDs spent approximately 41% of their affiliate fees on sports networks, which is consistent with the shares allocated by the Judges to JSC in the 2010-13 Cable Final Determination, adjusted for satellite volumes. Finally, if the Judges decide to rely upon survey evidence in allocating satellite royalties, they should use the Bortz surveys and not the Horowitz surveys.

I declare under penalty of perjury that the foregoing is true and correct.

_____   6-26-19
James M. Trautman   _____
                                          Date

APPENDIX A.

CABLE NETWORK LICENSE FEES PER RATING POINT, 2010-13

Table A-1. Summary of License Fees Per Rating Point for Homonoff Top 50 Networks, 2010-13

Network Type	2013	2012	2011	2010	Average: 2010-13
License Fees Per 24-Hour Rating Point:					
Top 50	$1.01	$0.93	$0.83	$0.76	$0.88
Sports Networks	$5.90	$5.25	$4.85	$4.31	$5.06
News Networks	$1.08	$0.98	$0.83	$0.85	$0.95
PSE Networks	$0.70	$0.65	$0.58	$0.53	$0.61
License Fees Per Prime Time Rating Point:					
Top 50	$0.64	$0.59	$0.53	$0.50	$0.56
Sports Networks	$2.86	$2.60	$2.40	$2.27	$2.53
News Networks	$0.82	$0.70	$0.62	$0.62	$0.70
PSE Networks	$0.44	$0.41	$0.37	$0.34	$0.39
Sports to Top 50 Ratio:					
24-Hour	**5.84**	**5.62**	**5.84**	**5.66**	**5.73**
Prime Time	**4.49**	**4.44**	**4.52**	**4.57**	**4.50**
Sports to News Ratio:					
24-Hour	**5.46**	**5.33**	**5.86**	**5.08**	**5.34**
Prime Time	**3.48**	**3.71**	**3.90**	**3.69**	**3.64**
Sports to PSE Ratio:					
24-Hour	**8.46**	**8.08**	**8.39**	**8.19**	**8.28**
Prime Time	**6.52**	**6.38**	**6.49**	**6.59**	**6.50**

Sources: Homonoff Exhibit 4; Nielsen ratings as reported by Kagan, a media research group within S&P Global Market Intelligence.

TABLES A-2 through A-5

REDACTED - RESTRICTED PURSUANT TO
PROTECTIVE ORDER, 14-CRB-0011-SD (2010-13) (MAR. 31 2016)

APPENDIX B.

CABLE NETWORK LICENSE FEES, 2010-13

APPENDIX B

**REDACTED - RESTRICTED PURSUANT TO
PROTECTIVE ORDER, 14-CRB-0011-SD (2010-13) (MAR. 31 2016)**

Before the
COPYRIGHT ROYALTY JUDGES
Washington, DC

	)	
In re	)	
	)	
DISTRIBUTION OF	)	**NO. 14-CRB-0011-SD (2010-13)**
SATELLITE ROYALTY FUNDS	)	
	)	

Written Rebuttal Testimony of

Daniel M. Hartman

August 26, 2019

I.   QUALIFICATIONS

1.   I am president of Hartman Media Consultants, providing consulting services for various media clients, including cable television networks, program distributors and investors in television programming distribution. I have twenty years of experience in the satellite television business as an executive responsible for the valuation and acquisition of television programming, including fifteen years in that capacity at DirecTV, the nation's largest satellite television provider. During my tenure at DirecTV, I worked regularly with the CEO and other senior executives as lead strategist with respect to pricing and packaging of content as well as budgeting and forecasting of programming costs. I was closely involved in the selection of channels for DirecTV (including distant signal programming). My responsibilities required me to be familiar with the types of programming offered by DirecTV's competition as well as the value of, and fair market price for, that programming.

2.   My background and qualifications are described more fully in Appendix A to my Written Direct Testimony dated March 22, 2019 and corrected June 7, 2019, submitted to the Copyright Royalty Judges ("Judges") on behalf of the Joint Sports Claimants ("JSC").

II.   INTRODUCTION AND SUMMARY

3.   I have reviewed the testimony of Program Supplier witnesses Dr. Jeffrey S. Gray and Howard Homonoff and Settling Devotional Claimants ("SDC") witnesses Dr. William J. Brown, Dr. John S. Sanders and Toby Berlin.[1]

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[1] Amended Written Direct Testimony of Jeffrey S. Gray, Ph.D., Docket No. 14-CRB-0011-SD (2010-13) (June 7, 2019) ("Gray AWDT"); Amended Written Direct Testimony of Howard B. Homonoff, 14-CRB-0011-SD (2010-13) (June 7, 2019) ("Homonoff AWDT"); Amended Written Direct Testimony of John S. Sanders, 14-CRB-0011-SD (2010-13) (June 7, 2019) ("Sanders AWDT"); Written Direct Testimony of Toby Berlin, 14-CRB-0011-SD (2010-13) (March 22, 2019) ("Berlin WDT"); Written Direct Testimony of Dr. William J. Brown, 14-CRB-0011-SD (2010-13) (March 22, 2019).

4.   As I set forth in my Written Direct Testimony, cable and satellite MVPDs compete in the same market for the same subscribers. The business models are the same and both value programming similarly. Witnesses for Program Suppliers and SDC agree that this is the case.

5.   Dr. Gray is incorrect when he asserts that WGNA was not valued by satellite subscribers. I negotiated many programming distribution agreements during my tenure at DirecTV, including an agreement for the rights to continue receiving the satellite signal of WGNA during the 2010-2013 period. It is true that much of the WGNA programming within the Program Suppliers category, including infomercials, was not valuable. However, both cable and satellite MVPDs valued WGNA for its live sports programming and the passionate fan base that this programming served, and they chose to carry WGNA for this reason. The availability of live team sports programming on WGNA factored heavily into DirecTV's decision to carry it as a distant signal pursuant to the Section 119 license.

6.   Dr. Gray's "enhanced viewing" study fails to demonstrate the relative value of the different categories of Section 119 programming because viewership does not equate with value, particularly for sports programming. MVPDs are concerned with attracting and retaining subscribers, which requires considering many other factors, including: (1) cost of the channel, (2) strength of subscriber demand for the programming on the channel (*i.e.* will the MVPD risk subscriber loss if it doesn't offer this programming?), and (3) carriage by the competition. Live team sports programming in particular, given the passion and commitment of sports fans, commands a significant premium relative to its share of viewing as opposed to other programming.

7.   Mr. Homonoff's analysis of the top 50 most widely distributed cable networks ("Top 50 Networks") is conceptually flawed and generates misleading results. He is incorrect when he says that the extent of carriage of a particular network indicates the relative value of that

network, or that carriage can be used as a proxy for determining the relative value of different networks or categories of programming. When it comes to valuing programming, from an MVPD's perspective, bulk does not necessarily equal value. When I was in charge of programming negotiations at DirecTV, the company spent approximately 40% of its affiliate fee budget on sports programming, even though sports programming made up a small share of volume. In fact, Mr. Homonoff's own analysis shows this same phenomenon. Mr. Homonoff's analysis is also flawed because it fails to account for highly valuable cable networks carrying live team sports content, namely regional sports networks ("RSNs"), which are an integral part of an MVPD's lineup.

8. SDC's witnesses overstate the value of Devotional programming to MVPDs. While such programming may be "niche," MVPDs see limited value in such programming. I am not aware of any instance where DirecTV paid to carry such programming, and in fact DirecTV was frequently paid by religious programmers for carriage under the FCC's "Set Aside Rules." Devotional programming did not drive any of DirecTV's carriage decisions under Section 119 in the 2010-13 period.

III. CABLE AND SATELLITE MVPDS VALUE PROGRAMMING SIMILARLY AND BOTH HIGHLY VALUE LIVE TEAM SPORTS PROGRAMMING

9. Cable and satellite MVPDs compete for the same customers, and MVPD executives are all driven by the same key considerations as they execute their respective business plans.[2] MVPD executives value programming similarly given that they are competing in the same space. Witnesses for both Program Suppliers and SDC have testified that cable and satellite MVPDs

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[2] *See* Corrected Written Direct Testimony of Daniel Hartman, 14-CRB-0011-SD (2010-13) (June 7, 2019) ("Hartman WDT"), at ¶¶ 20-22.

compete in the same marketplace.[3] Cable and satellite MVPDs therefore value the programming

carried pursuant to the Section 111 and 119 compulsory licenses similarly.

10.   Both satellite and cable MVPDs value live team sports programming more highly

than any other category of programming; they value the live team sports programming on distant

signals more highly than any other distant signal programming.[4] Live team sports programming

is unique, differentiated content. Each is an experience that viewers want to watch in real time,

and, unlike most other programming, live team sports programming is resistant to time shifting.

During the 2010-13 period, scores from sporting events were available instantaneously online

(sometimes unavoidably), and therefore any delay in watching can spoil the results for a fan. Many

sports fans are incredibly passionate about all the teams that they follow, and MVPDs offer this

programming (and offer it live) in order to compete for pay television subscribers.

11.   The high value of live team sports programming explains why WGNA was the most

widely carried distant signal on both cable and satellite during the 2010-13 period.[5] During the

2010-13 period, WGNA telecast more than 100 live games on its channel each year.[6] The MLB

and NBA games on WGNA served a particular fan base, on a national basis, and these games were

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[3] *See, e.g.*, Homonoff AWDT at ¶ 16 ("The process by which cable and satellite operators construct their programming line-ups is fundamentally consistent."); Sanders AWDT at ¶ 12 ("[T]he cable and satellite MVPD companies are grouped together and characterized as a single multichannel industry by operators and investors."); Berlin WDT, at 9-10, 12.

[4] JSC Ex. 5, Written Direct Testimony of Allan Singer, 14-CRB-0010-CD (2010-13), at ¶¶ 15-16 ("Sports programming is the most expensive programming on a cable system precisely because in many instances without it a CSO will lose subscribers").

[5] I have also reviewed the testimony of several industry executives who have previously testified to the high value of JSC programming. JSC Ex. 8, Testimony of Judith Allen, Docket No. 2001-8 CARP CD 1998-99 (Nov. 27, 2002); JSC Ex. 12, Testimony of Michael Egan, Docket No. 2001-8 CARP CD 1998-1999 (Nov. 25, 2002); JSC Ex. 17, Testimony of Judith Meyka, Docket No. 2007-3 CARP CD 2004-05 (June 1, 2009); JSC Ex. 18, Testimony of James Mooney, Docket No. 94-3 CARP CD 1990-1992 (Aug. 15, 1995); JSC Ex. 19, Testimony of Trygve Myhren, Docket No. 94-3 CARP CD 1990-1992 (Aug.15, 1995); JSC Ex. 24, Testimony of June Travis, Docket No. 2001-8 CARP CD 1998-99 (Nov. 27, 2002); JSC Ex. 27, Testimony of Roger Werner, CRT Docket No. 91-2-89 CD (1989 Proceeding); JSC Ex. 29, Testimony of Robert Wussler, CRT Docket No. 91-2-89 CD (1989 Proceeding).

[6] The number of compensable JSC telecasts on WGNA in the 2010-13 and 2004-05 periods was essentially the same. *See* JSC Ex. 3, Written Rebuttal Testimony of Daniel Hartman, Docket No. 14-CRB-0010-CD (2010-13) (Sept. 15, 2017), at 6, Table III-1.

therefore an important part of the DirecTV channel lineup. Ceasing carriage of WGNA would have upset many subscribers, largely due to the passion of these sports fans, and would have likely caused some subscribers to cancel their subscriptions.

12.   DirecTV placed much greater value on the JSC programming on WGNA than on the general entertainment programming on WGNA. The largest category of compensable Program Supplier content on WGNA was infomercials.[7] Such programming had no value to DirecTV and, in fact, was viewed negatively; it did not attract or retain subscribers.[8] While the channel receives compensation for running infomercials, the MVPD distributing the channel does not. I would have elected not to carry the infomercials if I was permitted to delete them. The reruns of sitcoms and older movies on WGNA also had much less value to DirecTV because the content was not unique and was widely available on other signals and from other sources. For example, I valued a live Cubs or Bulls game on WGNA much more highly than older movies such as *102 Dalmatians* and *Underdog*, or a rerun of the syndicated series *Cheers* or *Just Shoot Me*.[9]

13.   Dr. Gray attempts to downplay the importance of WGNA by suggesting that the station itself was not valued by MVPDs, but rather came along with a bundle of more popular channels.[10] However, Dr. Gray offers no support for this theory. Moreover, he misunderstands why MVPDs carried WGNA during the 2010-13 period. During the 2010-13 period, MVPDs viewed channels with live team sports as a key differentiator from other subscription services that did not carry them (e.g., Netflix, Amazon) and as vital to maintaining their subscribers. Many subscribers valued WGNA given the amount of live team sports available on the channel featuring

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[7] Written Direct Testimony of James M. Trautman, Docket No. 14-CRB-0011-SD (2010-13) (corrected June 7, 2019), at 20.
[8] Hartman AWDT at ¶ 17.
[9] JSC Ex. 21, Corrected Written Rebuttal Testimony of James M. Trautman, Docket No. 14-CRB-0010-CD (2010-13) (Oct. 5, 2017), at Appendix B.
[10] Gray AWDT, at ¶¶ 29-30.

teams that have national appeal. DirecTV considered WGNA a driver to the packages in which it was carried, as many sports fans are passionate about the team(s) they follow and will often subscribe to that package of channels that enables them to view those live games. As an MVPD programming executive, WGNA represented a good value given the strong sports programming carried, regardless of how its viewership compared to other channels. In fact, during the 2010-2013 period, WGNA accounted for over 70% of the total Section 119 royalty fees paid by DirecTV. DirecTV paid these fees because WGNA had strong sports programming and represented a good value based on that content.

IV.   VIEWING DOES NOT EQUATE WITH VALUE TO SATELLITE CARRIERS

14.   Dr. Gray's testimony relies on the assumption that viewing levels are the best available measure of value. This is simply not the case.

15.   As I stated in my Written Rebuttal Testimony in the 2010-2013 Cable Proceeding, viewership does not equate with value, particularly for sports programming.[11] In my experience, sports programming has a far greater value per unit of viewing than other type of content. Thus, I disagree with Dr. Gray in his assertion that a reasonable measure of the relative marketplace value of a program is the relative level of subscriber viewing of that program. In my experience, the level of viewership is not the driving factor in an MVPD's valuation of a signal. MVPDs considered the cost of the channel, the strength of the product on the channel and whether they considered the channel to be necessary to compete. When evaluating a channel, I would also look at the type of product on the channel and the importance of the product to the subscribers. Many sports fans are incredibly passionate about the teams they follow. Sports fans may switch video

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[11] JSC Ex. 3 (Hartman 2010-13 Cable WRT) at ¶¶ 32-34.

providers if their favorite college and/or professional teams are not being offered. Moreover, an offering of more than 100 professional baseball and basketball games per year—such as WGNA provided during 2010-13—was attractive to sports fans even if they were not avid fans of the Cubs, White Sox and Bulls.

16.   Dr. Gray claims that his enhanced viewing analysis considers three factors in addition to viewing: (1) the number of distant subscribers, (2) the time of day the program was aired, and (3) the type of programming (e.g., public affairs vs a sitcom or movie).[12] I have not reviewed the technical details of Dr. Gray's regression analysis and cannot evaluate the accuracy of this claim. Even if we assume it is correct, however, these three additional factors are still not sufficient to value programming. The potential audience size, or the time of day, even when combined with viewing data, is not sufficient to value programming. (This is true even if all of the relevant data are accurate; however, I understand that there are significant issues with the viewing data upon which Dr. Gray relies.[13]) Dr. Gray's additional data points do not take into account the importance of certain programming to the viewer. Nor does it take into account the importance that MVPDs actually place on certain programming. Programming executives make channel decisions based on factors such as cost, strength of product, and competitive need to carry.

17.   The fact that viewership does not equate with value is borne out when examining the license fees MVPDs pay to carry sports networks as opposed to other types of networks. In my experience, sports programming has a far greater value per unit of viewing than other types of programming.[14] During the 2010-2013 period, channels carrying sports programming accounted

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[12] Gray AWDT at ¶ 63.

[13] Written Rebuttal Testimony of William Wecker, Ph.D. and R. Garrison Harvey, Docket No. 14-CRB-0011-SD (2010-13) (Aug. 26, 2019).

[14] JSC Ex. 3 (Hartman 2010-13 Cable WRT) at ¶ 32. *See also* Written Rebuttal Testimony of James M. Trautman, Docket No. 14-CRB-0011-SD (2010-13) (Aug. 26, 2019), at Figures 1, 2 ("Trautman Satellite WRT"); JSC Ex. 14,

for approximately 40% of DirecTV's overall programming budget. Viewership data alone would not support the very high license fees MVPDs pay for channels carrying live sports. In fact, the percentage of DirecTV's budget spent on sports channels would far exceed those networks' share of total viewing. The high costs that MVPDs paid for sports programming reflects the high value of that programming to their platforms. Carrying live professional and college team sports is critical to the survival of an MVPD in a world where subscribers have increasingly more options for watching content.

18.   For example, RSNs are among the most expensive channels carried by MVPDs (generally second in cost only to ESPN). Yet the overall ratings on these channels are not large. The majority of programming on an RSN is not live team sports (with most of this ancillary programming having little or no value), and this ancillary programming garners minimal ratings. Yet MVPDs pay very high license fees to carry these RSNs simply for access to the live games.

19.   An analysis of MVPD programming expenditures also indicates that MVPDs value live team sports more highly than any other category, and more highly than one would expect based on viewership alone. Two different networks with similar ratings may have widely divergent license fees based on their content; conversely, two different networks that command equal license fees may have very different ratings. In my experience as an MVPD programming executive, the networks that command the greatest license fees relative to their ratings tend to be those that carry sports programming.

20.   For example, in 2010-2013, ESPN's license fees averaged over $ ▇ per subscriber, and its average 24-hour rating was ▇—a ▇ ratio (license fee divided by rating). In

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Written Rebuttal Testimony of Mark Israel, Ph.D, Docket No. 2014-CRB-0010-CD (2010-13) (Oct. 5, 2017), at ¶¶ 38-40, 45-47.

that same period, the license fee for the Mid-Atlantic Sports Network, an RSN, averaged $███ per

subscriber, and its average 24-hour rating was ████—a ███ ratio. In contrast, during 2010-2013,

USA Network's license fees averaged $███ per subscriber, and its average 24-hour rating was

███—a ███ ratio—while the Disney Channel's license fees averaged over $███ per subscriber,

and its average 24-hour rating was ███— a ███ ratio. ESPN and Mid-Atlantic Sports Network

(both of which have high license fee to ratings ratios) each carry JSC programming, while USA

Network and Disney Channel carry almost exclusively Program Suppliers' programming.[15]

21.   Consider the cases of TBS and TNT. Both networks carry JSC sports (including

MLB, NBA, and March Madness games) as well as other categories of programming. In the 2010-

13 cable proceeding, Dr. Mark Israel analyzed the content on those channels and found that in

2010-2013, while JSC programming comprised only 5.52% of household viewing hours

("HHVH") on TBS and 7.93% of HHVH on TNT, 44.40% of TBS's program expenditures, and

45.56% of TNT's program expenditures, were for JSC programming.[16]

Network	Category	Total Programming Hours	Total HHVH (000)	Expeditures ($M)	Expenditures per Hour of Programming	Expenditures per Hour of Viewing
					[D] =	[E] =
		[A]	[B]	[C]	[C] / [A]	[C] / [B]
TBS	JSC	684.0	1,220,722.6	$1,031.0	$1,507,370.6	$0.845
	Non-JSC	34,356.0	20,880,757.4	$1,291.2	$37,581.7	$0.062
	JSC / Non-JSC	0.02	0.06	0.80	40.11	13.66
	JSC % of Total	1.95%	5.52%	44.40%		
TNT	JSC	977.0	2,513,281.9	$2,042.0	$2,090,056.2	$0.812
	Non-JSC	34,063.0	29,162,878.1	$2,450.2	$71,931.9	$0.084
	JSC / Non-JSC	0.03	0.09	0.83	29.06	9.67
	JSC % of Total	2.79%	7.93%	45.46%		

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[15] Trautman Satellite WRT at Tables A-2, A-4.
[16] JSC Ex. 4, Written Direct Testimony of Mark Israel, Ph.D., Docket No. 14-CRB-0010-CD (2010-13) (Dec. 22, 2016) at ¶¶ 49-50.

22.   Mr. Homonoff argues that Dr. Israel's cable content analysis is not as probative as an analysis of an MVPD's affiliate fee expenditures. In my opinion, both are relevant data points. Cable networks' expenditures are informed by what they can ultimately charge MVPDs for rights to their content. The high license fees paid by networks for live sports rights is a direct reflection of how popular and in demand this programming is. Tellingly, Mr. Homonoff's analysis of MVPD affiliate fees shows very similar results to Dr. Israel's cable content analysis and confirms that there is not a one-to-one correlation between viewing and value. Likewise, Mr. Trautman analyzes the relationship between license fees and ratings, and finds that, on average, MVPDs pay $5.06 per 24-hour rating point for sports networks in the Top 50—more than $4.00 more per rating point than they do for the Top 50 overall.[17]

23.   The above also demonstrates that ratios of volume to viewing that Dr. Gray argues calculate the premium MVPDs pay for particular types of program do nothing of the sort.[18] The premium calculated by Dr. Gray for JSC programming, 1.28, is far lower than the premium I ascribed to JSC programming as an executive at DirecTV, as well as those reflected in the testimony of Dr. Israel and Mr. Homonoff.[19]

V.   MR. HOMONOFF'S ANALYSIS OF TOP 50 NETWORKS BY SUBSCRIBERS IS MISGUIDED IN SEVERAL RESPECTS

A.   Volume Is Not The Equivalent Of Value

24.   Mr. Homonoff and Dr. Gray (to a lesser extent) argue that the volume of programming in each claimant category that is carried by satellite MVPDs is indicative of that

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[17] Trautman Satellite WRT at Fig. 1.
[18] Gray AWDT at ¶ 38.
[19] Homonoff AWDT at ¶ 42 (Figure 2); ¶¶ 54-55; Exhibit 4 (Israel 2010-13 Cable WRT) at ¶¶ 38-40, 45-47.

programming's relative value.[20] From an MVPD's perspective, however, the value and volume of different categories of programming are not closely correlated. Some categories of programming are relatively cheap and abundant, while others are far costlier and therefore only make up a limited portion of the programming lineup. Live team sports is the most valuable category of programming precisely because it is finite and limited in nature (there are only so many games in a season), and in the 2010-13 period, live team sports were generally available only on MVPD platforms. These features of live teams sports programming make that programming far more attractive to MVPD platforms compared to non-sports programming.

25.   It is frequently the case that JSC programming drives carriage decisions for particular networks, even though JSC programming constitutes a minority of the programming on that network. MVPDs ascribe almost all of the value on an RSN to its live sports programming, giving very little value to the other programming that fills out the schedule.

26.   That is the case for WGNA as well. Live telecasts of Cubs, Bulls and White Sox games were by far the most important programming on the network. Infomercials had no value to me as a distributor, and reruns of movies and sitcoms had a much more limited appeal than WGNA's live team sports content. Two or three hours of a Cubs or a Bulls game were far more valuable to me as a programming executive than a greater number of hours of other programming telecast on WGNA.

27.   Mr. Homonoff's own analysis shows a lack of correlation between volume and affiliate fees. According to his review of content categories of the Top 50 Networks, 40 of those

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[20] Homonoff AWDT at ¶ 36 (arguing that prevalence of carriage of particular categories of programming reveals satellite operators' relative valuations); Gray AWDT ¶ 49 ("The volume of programming by category type . . . provides a rough measure of relative market value").

50 networks (80%) should be labeled as Program Suppliers networks.[21] According to his analysis, these 40 networks command 58.5% of the total license fees paid for the Top 50 Networks,[22] clearly not a one-to-one correlation. Further, Mr. Homonoff's analysis shows that while JSC programming accounted for only about 1% of the Top 50 network programming,[23] and that JSC networks accounted for only 6% of Top 50 Networks,[24] the license fees for those JSC networks accounted for 31.5% of total license fees paid for those Top 50 Networks.[25] These data further emphasize the outsized importance that JSC programming carries with MVPDs.

28.   Many networks that have similar distribution levels have very different license fees, which shows that the distribution of a cable network does not correspond to how much an MVPD will pay to carry it. According to Homonoff, Lifetime Television is distributed to approximately 98.9 million subscribers and had an average license fee during 2010-2013 of $███, while ESPN, with nearly identical distribution commanded a license fee of $███.[26] This is a true measure of the outsized importance that live sports has to MVPDs, as well as the channels that broadcast this product. Similarly, Food Network and TNT both have approximately 99.6 million subscribers, were distributed to essentially the same number of subscribers and yet TNT, which broadcasts popular MLB, NBA, and March Madness games, commanded a license fee more than seven times greater than Food Network's.[27]

29.   In the 2010-13 Cable Proceeding, Dr. Israel examined the relationship between viewing and programming expenditures for different types of networks. He found that for the top

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[21] *Id.* at ¶ 40.
[22] *Id.* at ¶ 54.
[23] *Id.* at ¶ 50.
[24] *Id.* at ¶ 42.
[25] *Id.* at ¶ 54.
[26] *Id.* at Table 1 & Ex. 4.
[27] *Id.*

25 cable networks, while the number of JSC programming hours transmitted on these networks represented only 1.06% of all programming, this programming commanded more than 22% of the amount those networks spent on programming.[28] Networks (and consequently MVPDs) pay more for college and professional sports content because it is vital to their business model.

Table 6: Cable Content Analysis 2010-13, Summary of Top 25 Networks

Category	Total Programming Hours	Total HHVH (000)	Expeditures ($M)	Expenditures per Hour of Programming	Expenditures per Hour of Viewing
				[D] =	[E] =
	[A]	[B]	[C]	[C] / [A]	[C] / [B]
JSC	9,274.0	15,164,368.9	$12,524.7	$1,350,513.0	$0.826
Non-JSC	866,726.0	496,492,970.2	$42,702.0	$49,268.2	$0.086
JSC / Non-JSC	0.01	0.03	0.29	27.41	9.60
JSC % of Total	1.06%	2.96%	22.68%		

Sources: Economics of Basic Cable 2015; various articles from Sports Media Watch, Sports Business Daily, ESPN Media Zone, TV By the Numbers, Soccer America, NY Times, USA Today, WSJ, Morgan Wick, and other various sources. See my underlying documents for a full list of sources.

30.   When determining the value of a particular network, MVPDs look for signature or marquee content or shows on the network (e. g., live sports), or content that differentiates it from other channels on the platform. Because of sports programming's unique characteristics, losing a network with live sports has much more dire consequences for an MVPD than losing other types of content. MVPDs offer live college and professional sports programming in order to compete with other distributors of programming. From an MVPD's perspective, not carrying (or ceasing to carry) a channel carrying live team sports content presents a higher risk of adverse subscriber reactions, including subscriber losses. Volume measures alone do not capture the high value subscribers (and, in turn, MVPDs) place on live sports content.

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[28] JSC Ex. 14 (Israel 2010-13 Cable WRT) at ¶ 38, Table 6.

B.   Homonoff's Analysis Is Flawed In Several Other Respects

31.   In addition to being conceptually flawed, Mr. Homonoff's volume analysis misleadingly focuses on a particular subset of cable networks that excludes nearly all of the most valuable cable networks carrying live team sports. His analysis only includes certain "nationally-based services" and omits regional sports networks (RSNs), arguing that choices made among the nationally distributed cable networks provide a truer picture of the overall cable network marketplace.[29] By not including RSNs, Mr. Homonoff ignores much of the most valuable programming that MVPDs carry. As an MVPD programming executive, I valued RSNs far more highly than many nationally distributed cable networks. I would much rather have access to San Francisco Giants and Golden State Warriors games on NBC Sports Bay Area or Washington Capitals and Washington Wizards games on NBC Sports Washington than have access to the product on WE TV, POP, Paramount TV or MTV2 (each of which is included in Mr. Homonoff's study). Not carrying RSNs would put an MVPD at a major disadvantage vis-a-vis its competitors.

32.   Mr. Homonoff also is mistaken to emphasize the quantity of non-JSC programming on cable networks like ESPN, ESPN2 and Fox Sports 1.[30] As a programming executive at DirecTV, I carried these networks first and foremost for their live team sports programming. While other programming on these networks—including telecasts like "First Take" and "SportsCenter"—does have some value, it is a small fraction of what the live team sports programming is worth. If the EPSN channels did not telecast live team sports, the license fees for these networks would be many multiples less.

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[29] Homonoff AWDT at ¶ 14, n.6.
[30] *Id.* at ¶ 49.

33.   Finally, Mr. Homonoff acknowledges that there has been an explosion in video programming over the internet. He notes that by 2010-2013, Netflix, Hulu and Amazon all provided subscribers significant opportunities to view the types of content that satellite operators licensed from cable networks, making it all the more critical how satellite operators allocated their programming expenditures among the various competing network options.[31] He is correct in this assertion; however, he fails to mention that much of the content available on these other platforms is similar to Program Supplier content, thus rendering this content less valuable to MVPDs. When satellite carriers decided how to allocate their programming expenditures in the 2010-13 period, they took into account what types of content were generally not available on Netflix, Amazon and Hulu—including primarily live team sports.

VI.   DIRECTV ASCRIBED VERY LITTLE VALUE TO DEVOTIONAL PROGRAMMING

34.   SDC witnesses testify to the "niche" value of religious programming on distant signals.[32] In the 2010-13 Cable Final Determination, the Judges adjusted SDC's allocation upward based in part on similar testimony "concerning the 'niche' value of devotional programming."[33] SDC's witnesses, however, overstate the value of Devotional programming to satellite MVPDs. Notwithstanding its purported "niche" appeal, I am not aware of DirecTV paying to carry a religious cable network, and during the 2010-13 period DirecTV did not choose to carry any signals pursuant to the Section 119 license for their Devotional content. I did not attribute special value to Devotional programming merely because it appealed to a particular subscriber niche.

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[31] *Id.* at ¶ 30.
[32] Sanders AWDT at ¶ 17; Berlin WDT at 8, 10
[33] Distribution of Cable Royalty Funds, 84 Fed. Reg. 3552, 3611 (Feb. 12, 2019).

35.   Most of the Devotional channels distributed on DirecTV were launched and carried under the Federal Communications Commission's "set aside" rules (the "Set Aside Rules") enacted in 1998.[34]   Under these rules, the FCC required satellite MVPDs to devote 4% of their channel capacity to public interest programming (*i.e.*, non-commercial programming of an educational or informational nature).   Many religious channels are considered public interest channels and thus fill a need for DirecTV when it looks for channels to launch that will satisfy these Set Aside Rules.   Religious channels constituted a significant proportion of the channels applying for carriage on DirecTV under the Set Aside Rules.

36.   DirecTV carries a mix of public interest channels pursuant to the Set Aside Rules, mostly educational and religious (e.g., CSPAN, BYU TV, NASA, Church Channel, EWTN). Under the Set Aside Rules, public interest channels do not receive compensation from the satellite operator.   Instead, the channels themselves are required to pay half of the costs incurred by the operator in making the programming available to its subscribers.   In other words, in the typical case where DirecTV carries a religious channel, the owner of the channel pays DirecTV for carriage.   It is unlikely many of these religious channels would have been launched by DirecTV had there not been a requirement to launch public interest channels under the Set Aside Rules.

37.   During the period from 2010-2013 I am not aware of any distant signals being carried by DirecTV that featured a significant amount of religious programming.   The distant signals carried by DirecTV were, in addition to WGNA, mostly network affiliate signals and stations affiliated with the CW.[35]   DirecTV would not have selected any of the Section 119 signals

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[34] 47 C.F.R. § 25.701(f)(1).

[35] Dr. Wecker and Mr. Harvey found that Devotional programming comprised less than 2% of all Section 119 programming during the 2010-13 period. *See* Corrected and Amended Written Direct Testimony of William E. Wecker, Ph.D. and R. Garrison Harvey, Docket No. 2014-CRB-0011-SD (2010-13) (June 7, 2019), at Table 5.

it carried during this period based on religious programming on the channel. None of SDC's witnesses identify any valuable religious programming carried on Section 119 signals.

38.   As Ms. Berlin notes, DirecTV sometimes carried limited amounts of Devotional programming on a pay-per-view ("PPV") basis. Running a particular program on a PPV basis takes up little satellite capacity because it can be pulled from the channel lineup at any time. There is little to no risk for DirecTV in exhibiting a PPV program: there is rarely (if ever) any cost to DirecTV for this content and there is limited bandwidth needed to carry.

39.   Ms. Berlin testifies that religious programming was important to DirecTV because it reduced "churn" (customers leaving the platform).[36] However, DirecTV relied on other, more important tactics, to reduce churn. DirecTV vetted its potential customers with credit checks in order to ensure that potential customers could afford the monthly subscription fees, both during their contractual commitment and after. DirecTV also developed a premium brand early on based on its technology that attracted a higher-end subscriber.

40.   Religious programming may fall within Ms. Berlin's broad definition of "niche" programming—which she argues includes the sports, foreign-language, and religious programming categories as well as programming targeted to children or women—but that alone says little about its value.[37] Ms. Berlin does not explain or define exactly what it is that makes each of these categories "niche," or why, as a category, niche programming is particularly valuable. In my experience, merely describing programming as "niche" does not explain whether it is valuable or not.

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[36] Berlin WDT at 9, 10.
[37] *Id.* at 8.

41.   Finally, Dr. Sanders states in his testimony that "[b]ecause satellite service is more prevalent in rural areas that are characterized by relatively large religious populations, Devotional programming becomes more important for satellite operators than cable companies."[38] During the 2010-13 period, I do not recall ever discussing that, as a satellite provider, DirecTV had a greater need to serve the religious community than a cable competitor would have because of our subscriber demographics, much less choosing to carry any Devotional content on this basis.

42.   In short, while Devotional programming does appeal to a particular "niche" of satellite subscribers, essentially all of the Devotional programming carried by satellite MVPDs is carried at no cost to the MVPD; frequently, the costs of airing this programming is at least partially borne by the Devotional content owners. Moreover, Devotional programming did not drive my decision-making on the carriage of Section 119 signals, and DirecTV did not carry any Section 119 signals in the 2010-13 period that prominently featured Devotional programming.

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[38] Sanders AWDT at ¶ 18.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 26, 2019.

Daniel M. Hartman

Before the
COPYRIGHT ROYALTY JUDGES
Washington, DC

	)	
In re	)	
	)	
DISTRIBUTION OF	)	**NO. 14-CRB-0011-SD (2010-13)**
SATELLITE ROYALTY FUNDS	)	
	)	

Written Rebuttal Testimony of

David Shull

August 26, 2019

I. QUALIFICATIONS

1. I am the current CEO of TiVo Corporation, and have worked as an executive in the media industry since 2004. From the end of 2008 through 2014, I was Senior Vice President, Programming, for Dish Network Corporation ("Dish"). In this position, I was Dish's primary decision-maker regarding programming carriage, including what signals to carry under the Section 119 license. In May of 2015, I joined the Weather Channel as its Group President for TV and was later promoted to CEO. My roles at The Weather Channel required me to negotiate contracts for our product with Weather Channel distributors, including cable system operators and satellite television companies. My experiences at Dish and Weather Channel provided me first-hand insight into the MVPD industry and extensive expertise in programming valuation.

2. My background and qualifications are described more fully in Appendix A to my Written Direct Testimony dated March 22, 2019 and corrected June 7, 2019 ("Written Direct Testimony"), submitted to the Copyright Royalty Judges ("Judges") on behalf of the Joint Sports Claimants ("JSC").

II. INTRODUCTION AND SUMMARY

3. I have reviewed the testimony of Program Supplier witnesses Dr. Jeffrey S. Gray and Howard Homonoff and Settling Devotional Claimants ("SDC") witnesses Dr. William J. Brown, Dr. John S. Sanders and Toby Berlin.[1]

4. Program Supplier witnesses Homonoff and Gray and Settling Devotional Claimants witnesses Sanders and Berlin agree that cable and satellite MVPDs compete directly

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[1] [1] Amended Written Direct Testimony of Jeffrey S. Gray, Ph.D., Docket No. 14-CRB-0011-SD (2010-13) (June 7, 2019) ("Gray AWDT"); Amended Written Direct Testimony of Howard B. Homonoff, Docket No. 14-CRB-0011-SD (2010-13) (June 7, 2019) ("Homonoff AWDT"); Amended Written Direct Testimony of John S. Sanders, Docket No. 14-CRB-0011-SD (2010-13) (June 7, 2019) ("Sanders WDT"); Written Direct Testimony of Toby Berlin, Docket No. 14-CRB-0011-SD (2010-13) (Mar. 22, 2019) ("Berlin WDT"); Written Direct Testimony of Dr. William J. Brown, Docket No. 14-CRB-0011-SD (2010-13) (Mar. 22, 2019).

with one another and therefore value programming and make carriage decisions in the same manner. This supports my opinion that the JSC share of the 2010-13 satellite royalty funds should be at least as high as its share of the 2010-13 cable royalty funds, and should in fact be adjusted upwards to account for the smaller number of satellite royalty claimants.

5.   An important driver of the value of JSC programming on Section 119 signals was the Cubs, White Sox and Bulls games on WGNA. Dr. Gray incorrectly downplays the importance of WGNA to satellite subscribers, arguing that these subscribers only received WGNA because it was bundled with other, more popular signals. Dr. Gray misunderstands how Dish constructed its channel lineups and the reasons Dish carried WGNA. Dish carried WGNA because it offered a significant number of live team sports telecasts, which were valued by Dish's subscribers.

6.   The live team sports programming on WGNA and other distant signals, and in the marketplace generally, is highly valuable because it is unique, differentiated content that is not available from multiple sources. It is valuable precisely because WGNA was the only source for this important live team sports content. Mr. Homonoff is therefore wrong to suggest that the Judges can evaluate the different categories of programming on Section 119 signals by simply looking to the quantity of each category carried by MVPDs. Many of the most widely distributed channels are among the cheapest to carry, because they are not particularly valuable for attracting and retaining subscribers and because the cable networks offer reduced rates or other economic discounts in exchange for wider carriage (which can help to sell advertisements).

7.   Relative levels of program viewership are likewise not the main drivers of the value of a particular category of programming. MVPDs consider numerous other factors in evaluating programming, including the uniqueness of the programming and the subscriber's level of passion for the programming. These factors explain the significant premium paid for live team sports

content. MVPDs, including Dish, pay far more to carry such programming than its share of viewership would otherwise imply.

8. Finally, the devotional programming at issue in this proceeding has little market value to satellite carriers. Dish typically did not pay to carry religious channels. These channels were often carried under either the FCC's public interest set aside rules or as paid commercial channels, and in either case the owner of the channel actually was required to pay Dish in order to receive carriage.

III. CABLE AND SATELLITE MVPDS VALUE PROGRAMMING IN THE SAME MANNER

9. As I stated in my written direct testimony, Dish competes directly not only with DirecTV but also with cable MVPDs.[2] They compete for the same subscribers using similar packages of programming, and therefore value programming in a very similar manner. Industry experts testifying on behalf of Program Suppliers and the Settling Devotional Claimants confirm that this is the case.[3]

10. Mr. Homonoff explains that "[t]he process by which cable and satellite operators construct their programming line-ups is fundamentally consistent" and that both cable and satellite MVPDs placed primary importance on attracting and retaining subscribers during the 2010-13 period.[4] I agree with these statements. As a programming executive at Dish during the 2010-13

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[2] *See* Corrected Written Direct Testimony of David Shull, Docket No. 14-CRB-0011-SD (2010-13) (June 7, 2019) ("Shull WDT"), at ¶¶ 16-18.

[3] *See* Sanders AWDT at ¶ 12 ("[C]able and satellite MVPD companies are grouped together and characterized as a single multichannel industry by operators and investors."); Sanders AWDT at 20 ("[C]able and satellite companies compete in the same marketplace and, as a consequence, compete for and value programming in a similar manner."); Berlin WDT at 9 ("By 2012 . . . DIRECTV and cable operators were simply trading subscribers back and forth (churn) based on what each advertised as a better product for a more attractive price, or more generous sign-up offers."); Homonoff AWDT at ¶ 20 ("DISH and DIRECTV had competed since their inception with cable operators").

[4] Homonoff AWDT at ¶ 16; *see also* Homonoff AWDT at ¶ 24 ("The importance of attracting and retaining subscribers for both cable operators and satellite operators was no less important in 2010-2013 than it was in 2004-2005 or than it is today.")

period, I viewed cable operators as competitors, and selected a programming line-up that I felt would best position Dish to attract new subscribers from my cable competitors, and, perhaps more importantly, keep my customers from leaving for cable.

11.   The other parties' concurrence on the relationship between cable and satellite MVPDs further supports my conclusion in my written direct testimony that JSC's share of the royalties allocated in this proceeding should be at least as high as its share of royalties in the 2010-13 Cable Final Determination.[5] I understand that the 2010-13 Cable Final Determination reflects the Judges' reasoned analysis of the relative fair marketplace value of different program categories during the 2010-13 period.[6] There is no reason why the relative fair marketplace value of JSC programming should be any lower to a satellite carrier than to a cable operator, given their similar approaches to program valuation. In fact, I would expect that the relative fair marketplace value of JSC programming to satellite carriers was higher during this period, given the smaller number of claimants to satellite royalties.

IV.   DISH CARRIED WGNA FOR ITS LIVE TEAM SPORTS PROGRAMMING

12.   Dr. Gray speculates that Dish subscribers may not have valued WGNA but rather received it simply because it was bundled with other stations.[7] Dr. Gray is wrong. WGNA was far and away the most important Section 119 signal Dish carried during the 2010-13 period, and Dish paid more than 70% of its Section 119 royalties to carry it.[8] Dish carried WGNA for the live team sports programming it offered, which included more than one hundred telecasts each year of Cubs, Bulls and White Sox games. Under the Section 119 license, Dish was able to carry WGNA

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[5] Shull WDT at ¶¶ 11-12.
[6] Distribution of Cable Royalty Funds¸ 84 Fed. Reg. 3552, 3555, 3610-11 (Feb. 12, 2019) ("2010 Cable Final Determination"); Amended Written Direct Testimony of Andrew R. Dick, Ph.D., Docket No. 14-CRB-0011-SD (2010-13) (June 7, 2019), at ¶¶ 13-26 (noting that in his expert opinion, the Judges' analytical framework in the 2010-13 Cable Proceeding is "aligned with well-established economic principles").
[7] Gray AWDT at ¶¶ 31, 33-34.
[8] Shull WDT at ¶ 26.

for approximately $0.25 per subscriber per month, which is considerably less than I would typically expect to pay for a cable network featuring this quantity of MLB and NBA games. At this price, WGNA was an excellent value and an effective way to add live sports programming from popular teams that I thought would help Dish to attract and retain subscribers.

13.   I would not have included WGNA in the AT-200 lineup if it were not valued by subscribers. Dish's AT-200 programming package is one of its standard offerings and is widely subscribed; it is important to Dish that this package is attractive and reasonably priced. This was equally true during the 2010-13 period. I would not have risked decreasing the appeal of the programming lineup (or unnecessarily increasing its cost) by including a channel that I thought my subscribers would not value. WGNA is included in the programming line-up because it has valuable MLB and NBA telecasts that complement the other programming offered in the package.

14.   This is true notwithstanding the fact that Dish did not identify WGNA as one of its "most popular" channels in the 2014 advertisement that Dr. Gray discusses in his testimony.[9] There is no direct correlation between the "popularity" identified in the advertisement and the role of the channel in attracting and retaining subscribers or its value to Dish. For instance, while we indicated in that advertisement that the Lifetime Movie Network ("LMN") was "popular," there are many subscribers who did not watch LMN at all, and I doubt we would have lost many subscribers if we had discontinued its carriage. This was reflected in LMN's cost of carriage, which, at approximately ▮▮▮ during this period, was less than half the price I paid under Section 119 to carry WGNA.[10]

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[9] Gray AWDT at ¶ 29 and Appendix B.
[10] Written Rebuttal Testimony of James M. Trautman, Docket No. 14-CRB-0011-SD (2010-13) (Aug. 26, 2019), at Fig. 5 ("Trautman Satellite WRT").

V. BREADTH OF CARRIAGE DOES NOT CORRELATE WITH PROGRAM VALUE

15.   Both Mr. Homonoff and Dr. Gray incorrectly assume that the breadth of carriage of a particular category of programming has a meaningful correlation with the value that MVPDs ascribe to that category.[11] This is simply not the case. The most plentiful programming is frequently the lowest cost, lowest value programming; the most valuable programming, like a live telecast of a Major League Baseball, NFL, NBA, or NCAA playoff game, is scarcer.

16.   In fact, it is frequently the case that cable networks will offer themselves for carriage at a lower cost so that they can obtain wider distribution, which helps them to sell more advertisements. In other words, many of the most widely carried networks were actually *cheaper* than one might otherwise expect, because they were sold at an effective discount. As a programming executive at Dish, I included these low-cost, broadly distributed networks in our lowest priced tiers of service, such as "Cable Basic" and "Extended Basic." DirecTV and cable have similar "save" packages. The margins for satellite carriers on these tiers of service are generally smaller than on higher priced tiers of service. We keep these lower priced tiers to bring in subscribers who might otherwise not subscribe to a paid cable or satellite service, in the hope that we can eventually convince them to upgrade to a higher tier of service, such as AT-200.

17.   Many of the "PSE" cable networks in Mr. Homonoff's analysis may also have been widely carried but nevertheless failed to command any significant affiliate fees from MVPDs. Networks like POP ███████, WETV ███████, and OWN ███████ were very cheap to carry; all three could be carried for less than the cost of carrying one Section 119 signal.[12]

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[11] Homonoff AWDT at ¶ 36 ("By reviewing the most prevalent programming offered on the cable networks . . .we can understand how satellite operators (conducting their business in this competitive environment) value different programming options to deliver to subscribers."); Gray AWDT at ¶ 49 ("The more programs of a certain type aired on the stations for retransmission, the more valuable that type of programming is to the satellite carrier and its subscribers, all else equal.")

[12] Trautman Satellite WRT at Table B-1.

18.   In addition to being offered at low (frequently discounted) prices, many of the PSE networks in Homonoff's Top 50 obtained wide carriage as a result of being bundled with more valuable programming. For instance, WETV is owned by AMC; AMC is able to obtain carriage for WETV as part of broader deals that incorporate more valuable AMC-owned channels. This was not true, on the other hand, for ESPN, which was carried for the live team sports on the network. In fact, ESPN's parent company, Disney, frequently used ESPN as leverage to convince MVPDs to carry other, less valuable general entertainment networks.

19.   Moreover, by focusing on breadth of carriage Mr. Homonoff admittedly ignores very highly valuable programming that is only carried within a particular geographic area, *i.e.* regional sports networks ("RSNs").[13] RSNs are frequently the most expensive cable networks to carry (outside of ESPN), and they are carried almost exclusively for their live team sports content. RSNs commanded high rates because they were critical to attracting and retaining subscribers. Mr. Homonoff's analysis expressly does not address at all the high value that MVPDs place on carrying RSNs.

20.   Finally, in addition to being conceptually flawed, Mr. Homonoff's analysis is flawed in application. In this analysis of the Top 50 cable networks, Mr. Homonoff treats both TNT and TBS as "PSE" networks.[14] This is at odds with my assessment of these networks as a programming executive at Dish. I found both TNT and TBS so important to carry (and to carry at a relatively high price) because of their live team sports content, which included March Madness, as well as MLB and NBA playoff games. These two networks would not have commanded the carriage fees that they did if they did not have this sports content.[15]

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[13] Homonoff AWDT at ¶ 15, n.6.
[14] *Id.* at 22 (Table 2).
[15] These two networks are the first (TNT) and fourth (TBS) most expensive networks labelled as "PSE" in Mr. Homonoff's study. *Id.*; *see also* Trautman Satellite WRT at Fig. 5. On the other hand, Mr. Homonoff's statement

VI.   RELATIVE LEVELS OF VIEWERSHIP DO NOT CORRELATE WITH PROGRAM VALUE

21.   I have reviewed Dr. Gray's "enhanced viewing" study, which purports to measure the relative value of each category of programming by reference to its relative share of viewership.[16] Dr. Gray is mistaken to attempt to measure programming value using viewership.

22.   In making programming decisions, programming executives consider a number of factors, including whether the programming was available from other sources (including both "over-the-top" platforms and on other channels); whether the programming is resistant to time-shifted viewing; and the level of subscriber engagement and depth of subscriber interest in the programming.[17] Subscriber viewership measures do not capture any of these factors.[18]

23.   These factors, including in particular subscribers' passion for particular programming, explain why MVPDs, including Dish, were willing to pay such a high premium for JSC programming during the 2010-13 period. Dish was far more likely to lose subscribers if it failed to carry live team sports programming as compared to reruns of sitcoms or old movies.

24.   The higher value of live team sports programming relative to its viewership was reflected in the costs Dish paid to carry sports content. Overall, Dish paid far more for sports programming than for other types of content with similar viewing levels. In 2010-13, approximately 35-40% of Dish's core programming costs was for sports content, notwithstanding that this programming did not command 35-40% of overall viewing.[19] Moreover, MVPDs

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that ESPN is primarily comprised of Program Suppliers' content misses the point. ESPN's primary value to MVPDs is its live professional and team sports content. Dish would not have paid nearly as much for ESPN without this content.

[16] Gray AWDT at ¶¶ 71-72 (Tables 4 and 5).

[17] Shull WDT at ¶ 9 ; JSC Ex. 2, Written Direct Testimony of Daniel Hartman, Docket No.14-CRB-00010-CD (2010-13) (Dec. 22, 2016) at ¶¶ 16, 20.

[18] During the 2010-13 Cable Proceeding, Program Suppliers' own witness acknowledged that there "is not necessarily a one-to-one correlation between viewership and value." Oral Testimony of Sue Ann Hamilton, Docket No. 14-CRB-0010-CD (Mar. 19, 2018) at 4371:3-6

[19] *See* Shull WDT at ¶ 25.

generally were willing to spend far more per ratings point for channels featuring live sports content than those that did not.[20]

25.   Dr. Gray is also mistaken to suggest that the relationship between the viewership share and volume share for a particular category of programming can explain the "premium" that MVPDs place on a particular category of programming.[21] Dr. Gray's own attempts to measure this "premium" demonstrate that this is the case, as Dr. Gray finds just a 1.28 ratio between JSC's share of viewing and its share of volume.[22] As an initial matter, I have never heard of anyone in the MVPD industry measuring the purported "premium" for a program by comparing the program's share of volume to its share of viewing. In any case, the premium Dr. Gray identifies for JSC is far lower than the premium that MVPDs like Dish pay in the real world for live team sports content.

26.   Mr. Trautman's analysis of affiliate fees during the 2010-13 shows why this premium is too low. As Mr. Trautman explains, MVPDs paid more than four times more per prime time rating point for sports networks than for the average Top 50 network. MVPDs paid more than six times as much per prime time rating point for sports networks as they did for "PSE" networks.[23]

27.   Indeed, Mr. Homonoff's own testimony—which is unreliable for the reasons I describe above—finds that JSC programming commands a far higher premium than Dr. Gray estimates in his testimony. Mr. Homonoff argues that approximately 6% of the Top 50 cable networks are "JSC" networks, and yet these networks command approximately 31% of the affiliate

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[20] Trautman Satellite WRT, at Fig. 1.
[21] Gray AWDT at ¶¶ 71-72 (Tables 4 and 5).
[22] *Id.* at ¶ 71 (Table 5).
[23] Even this analysis understates the premium paid for sports networks over "PSE" networks. As explained above, Mr. Homonoff includes TNT and TBS in the "PSE" category notwithstanding the primary role the sports content on these signals played in an MVPD's decision to carry them. *See* Homonoff AWDT at 22 (Table 2).

fees paid by MVPDs for all Top 50 networks combined.[24] The implied premium—more than

500%—is an order of magnitude greater than what Dr. Gray's viewership study finds.[25]

VII. DEVOTIONAL PROGRAMMING IS NOT PARTICULARLY VALUABLE, EVEN IF IT IS "NICHE"

28.   SDC Witnesses Dr. Williams J. Brown and Ms. Toby Berlin argue that "niche"

programming was increasingly important in 2010-13, and that Devotional programming was a

valuable niche market.[26] While Devotional programming may have a niche appeal, there are at

least two reasons why it would be a mistake to ascribe it a relatively high value on this basis alone.

First, many programs and channels that appeal to particular subscriber niches do not feature the

sort of unique, differentiated content that helps to attract and retain subscribers. *Second*, in the

case of Devotional programming in particular, MVPDs typically do not pay to carry this

programming.

29.   Ms. Berlin identifies as "niche" those networks that appealed to a "certain

demographic or a specific cultural profile," including "sports, women, foreign-language, children

and religion."[27] As defined, this is a very broad category of programming, and the value of

programming that meets this definition varies considerably. That a channel or cable network

appeals to a particular niche of MVPD subscribers does not always mean that the channel features

the sort of unique, differentiated content that would make it useful for attracting and retaining

subscribers. While it is certainly true that sports programming commanded a premium during the

2010-13 period, this reflected a depth of subscriber interest and engagement that simply was not

present for many other categories of "niche" content.

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[24] Homonoff AWDT at ¶¶ 44 (Figure 2), 54-55, Exhibit 4.
[25] Gray AWDT at ¶¶ 71-72 (Tables 4 and 5).
[26] *See, e.g.*, Brown WDT at 6; Berlin WDT at 7-8.
[27] Berlin WDT at 8.

30.   If niche networks, as a group, were reliably capable of attracting and retaining subscribers, I would expect MVPDs to be willing to pay relatively higher affiliate fees to carry them. However, while MVPDs are willing to pay considerably high fees for sports networks, they frequently do not do so for the other types of "niche" networks that Ms. Berlin identifies. For example, the following networks fit Ms. Berlin's definition of "niche" but were far cheaper to carry than any major sports network during the 2010-13 period:

- Lifetime Real Women: $███ affiliate fee during the 2010-13 period.
- TeenNick: $████████ affiliate fee during the 2010-13 period.
- CNN en Espanol: $████████ affiliate fee during the 2010-13 period.[28]

31.   Channels that focused on religious programming likewise did not command significant carriage fees. In fact, these channels were frequently carried at no cost to the MVPD, under the FCC's "set aside" rules for non-commercial programming.[29] Under these rules, satellite carriers are required to reserve four percent of channel capacity for use by "qualified programmers for noncommercial programming of an education or informational nature." When a channel is carried under these rules, the satellite carrier is permitted to charge—and sometimes does charge— the owner of the channel for carriage.[30]

32.   In other words, payment for carriage of these channels sometimes flows in the opposite direction of payment for standard cable networks: from the channel owner to the MVPD. It was only in relatively rare circumstances that an MVPD would be so interested in a particular religious channel that it would actually be willing to pay to carry it, given the wide availability of

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[28] Trautman Satellite WRT at Table B-1. Notwithstanding any "niche" appeal, the Spanish-language CNN channel cost much less to carry than CNN's flagship English-language channel. *Id.*
[29] 47 C.F.R. § 25.701(f)(1).
[30] *Id.* at § 25.701(f)(5).

religious programming at no cost. I am not aware of any instance in which Dish paid a significant carriage fee for the right to provide its subscribers with a religious cable network.

33.	Finally, Ms. Berlin and Mr. Brown also do not point to any particular, valuable Devotional programming on broadcast signals carried pursuant to Section 119. I am not aware of any Section 119 signal that Dish elected to carry during the 2010-13 period due to its Devotional programming.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 24, 2019.

David Shull

Before the
COPYRIGHT ROYALTY JUDGES
Washington, DC

	)	
In re	)	
	)	
DISTRIBUTION OF	)	**NO. 14-CRB-0010-SD (2010-13)**
SATELLITE ROYALTY FUNDS	)	
	)	

WRITTEN REBUTTAL TESTIMONY OF
WILLIAM E. WECKER, PH.D. AND R. GARRISON HARVEY

August 26, 2019

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I. QUALIFICATIONS

A. Dr. William E. Wecker

1.   I am a statistician and applied mathematician. I received the Bachelor of Science degree (Basic Sciences) from the United States Air Force Academy. I received both the Master of Science degree (Operations Research) and Doctor of Philosophy degree (Statistics and Management Science) from the University of Michigan. I have served on the faculties of the University of Chicago, the University of California, Davis, and Stanford University where I taught statistics and applied mathematics at the graduate level. I have performed research in statistical theory, statistical methods, and applied mathematics for over four decades. I am currently President of William E. Wecker Associates, Inc., an applied mathematics consulting firm located in Jackson, Wyoming. I am a member of the American Statistical Association, the Institute of Mathematical Statistics, and the Society for Risk Analysis. I have served as associate editor of the Journal of the American Statistical Association for four years and of the Journal of Business and Economic Statistics for eighteen years. A copy of my curriculum vitae is attached in Appendix A.

B. Mr. Robert Garrison Harvey

2.   I am a statistician and applied mathematician. I received the Bachelor of Science degree (Applied Mathematics) from the United States Air Force Academy and the Master of Science degree (Operations Research) from the Air Force Institute of Technology. I am currently Vice President and Principal Consultant at William E. Wecker Associates, Inc., an applied mathematics consulting firm located in Jackson, Wyoming. I have served as an expert witness in litigation, arbitration, and regulatory proceedings involving evaluation of damages, breach of contract, copyright infringement, consumer product performance, epidemiology, sample design, payment card market analysis and

profitability, statistical analysis of payment card industry data, and class certification. Additionally, I have worked as a consultant on numerous litigation and business consulting engagements including: antitrust matters involving claims of price-fixing; matters involving claims of false advertising, unfair competition and monopolization, consumer product safety and performance, and environmental damage; class actions alleging disparate impact in insurance, insurance claims, lending, and wages; and patent and intellectual property matters involving pharmaceutical drugs, petrochemical formulation, and automobile components. These qualifications and a list of my professional publications are in my curriculum vitae, which is attached in Appendix B.

II.   INTRODUCTION AND SUMMARY

3.   Dr. Jeffrey Gray's Amended Written Direct Testimony presents three different methodologies for determining the relative market value of programming distantly retransmitted pursuant to Section 119 of the Copyright Act: (a) a "viewing" study, (b) a measure of volume, and (c) a fees-based regression. Dr. Gray does not explain in his testimony the details of how he performed any of these analyses. We have reviewed the computer programs and databases underlying Dr. Gray's testimony in order to evaluate the details of his calculations, the limitations of the data upon which he relied, and the several unstated assumptions he made when he analyzed that data in order to arrive at the bottom-line numbers he reports.[1]

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[1] Amended Written Direct Testimony of Dr. Jeffrey S. Gray, Ph.D., Docket No. 14-CRB-0011-SD (2010-13) (June 7, 2019) ("Gray Testimony"); Written Direct Testimony of Paul Lindstrom, Docket No. 14-CRB-0011-SD (2010-13) (Mar. 22, 2019) ("Lindstrom Testimony").

4.   Based on our review, we conclude that none of the methodologies set forth in Dr. Gray's testimony provide a reliable and valid estimate of the relative market value of programming distantly retransmitted pursuant to Section 119 of the Copyright Act.

5.   Dr. Gray's "viewing" study is nearly identical to the "viewing" study he presented in the 2010-13 Cable allocation proceeding, except that his current study employs separate regression analyses for WGN and non-WGN stations; uses one fewer independent variable in his regression analyses; and applies Nielsen's National People Meter ("NPM") weights to the underlying data rather than using the unweighted NPM household counts. There are several problems with Dr. Gray's proposed viewing study. As an initial matter, the audience data set upon which Gray relies is not designed nor suitable for measuring viewership of broadcast signals retransmitted pursuant to the Section 119 compulsory license. This is reflected in the fact that the dataset upon which Dr. Gray relies lacks data for approximately 93.5 percent[2] of the quarter-hour increments of compensable programming at issue. In addition, the use of weights designed for Nielsen's NPM results in unreliable and indeed impossible estimates of viewing. The Gray regression analyses do not and cannot fix the fundamental problems with the underlying data. Comparisons of the results of the Gray viewing regression analyses to other known benchmarks confirm that the results are invalid. This report discusses Dr. Gray's "preferred approach" to estimating viewing (Table 4, Model 1)[3], see Appendix O for a discussion in three alternative viewing analyses. We discuss Dr. Gray's "viewing" study in Sections III, IV, and V.

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[2] 93.5% = 1-781,821/12,081,142, see Table 3.
[3] "Model 1 is my preferred approach", Gray Testimony ¶ 64.

6.   Gray also offers, in his Table 2, measures of the "volume" of carriage of distantly retransmitted programs by satellite carriers. As the Judges have previously held, volume measures alone do not provide a reliable estimate of relative market value. In addition, Gray's Table 2 does not account for differences in the number of subscribers who receive each signal, thereby improperly equating an hour of programming on WGN (retransmitted to about 22 million subscribers under Section 119) to an hour of programming on stations reaching only a few hundred or thousand subscribers. We discuss Dr. Gray's "volume" study in Section VI.

7.   Gray also performs a fees-based regression, although he does not suggest using it to measure relative market value. Dr. Gray's fee-based regression is unreliable and not statistically meaningful (i.e., all but one of his eight royalty share estimates are not statistically significant[4]). We discuss Dr. Gray's fees-based regression in Section VII.

III.   **THE LINDSTROM DATA USED IN DR. GRAY'S "VIEWING STUDY" IS NOT AN ADEQUATE SOURCE FOR RELIABILY ESTIMATING DISTANT VIEWING**

    A. **The Lindstrom Data Used by Dr. Gray is Neither Designed nor Suitable for Reliably Measuring Viewing of Stations Retransmitted Pursuant to the Section 119 Compulsory License**

8.   The "viewership" estimates set forth in Gray Table 4 are based on audience viewing data provided to Dr. Gray by Paul Lindstrom. Dr. Gray refers to the Lindstrom data as "Nielsen Distant Viewing Household Data for 2010-13," which he abbreviates as "Nielsen Viewing Data."[5]

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[4] None of the eight estimates are statistically significant at the 95% confidence level. Dr. Gray reports that one of his eight estimates is statistically significantly differently from zero at the 90% confidence level.

[5] Gray testimony, ¶ 43.

9.   Mr. Lindstrom explains that the data he provided to Dr. Gray came from Nielsen's national survey: "Program Suppliers contacted Nielsen and sought to obtain custom analyses of national household metered viewing data to satellite distant households for the 2010-2013 royalty years. Accordingly, Nielsen provided to MPAA a custom analysis of national household metered viewing data for each of the 2010-2013 years."[6] These analyses were "custom" in the sense that Lindstrom provided Gray with a subset of 2010-13 Nielsen's NPM data — data concerning viewership by NPM satellite households of programming broadcast by the broadcast stations carried pursuant to Section 119 during 2010-13. Lindstrom divided the households into those located within counties that Program Suppliers identified as "local" to each station and those located outside those counties (i.e., "distant households").[7]

10.   Dr. Gray's decision to use NPM data is highly significant. The size of the NPM sample and its composition are designed with the goal of measuring national viewership. Likewise, the weighting employed by the NPM is designed to project from the sample to an estimate of national viewing.[8] Neither the composition nor weighting of the NPM are intended to measure local viewing for the stations at issue in this case.[9]

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[6] Lindstrom Testimony, at 4.

[7] Lindstrom Testimony, at 4-5. Lindstrom says that "[w]here the viewing minutes to particular distant signal programs were so small as to be statistically insignificant, Nielsen's custom analysis would assign a zero viewing value." Lindstrom Testimony, p. 5. We understand that Program Suppliers provided no documents or data that would explain which data values were changed to zero and what principles and methods were used to determine which data to change, but merely stated that Mr. Lindstrom "relied on his knowledge and experience" and that there are no underlying documents regarding this element of his testimony. Furthermore, we understand that Mr. Lindstrom included the exact same statement in his written testimony in the 2010-13 cable proceeding, but admitted during cross-examination that the statement should have been stricken. *See* 2010-13 Cable Tr. at 3645.

[8] Written Rebuttal Testimony of Brad Adgate, Docket No. 14-CRB-0011-SD (2010-13) (Aug. 26, 2019), at 4-5 ("Adgate WRT"); JSC Ex. 20 Corrected Written Rebuttal Testimony of Susan Nathan, Docket No. 14-CRB-0010-CD (2010-13) (Oct. 5, 2017) at 5 ("Nathan WRT").

[9] Adgate WRT at 9-14; JSC Ex. 20 (Nathan WRT) at 9.

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11.   Many of the stations distantly retransmitted by satellite carriers during 2010-13 were not retransmitted nationally or viewed by subscribers nationally.[10] Thus, the question arises whether data from a sample designed to measure national viewership is suitable for reliably measuring non-national viewing of the individual stations at issue in this case.

12.   In order to answer this question, we focused on two aspects of the Lindstrom data — the composition and quantity of the data and the application of the NPM weights to the data. Both demonstrate that the Lindstrom data does not yield reliable estimates of viewing of the programming retransmitted pursuant to the Section 119 license.

B. The Composition of the Lindstrom Data Used by Dr. Gray

13.   Based upon information he received from Gracenote and the CRTC, Dr. Gray identified 12.1 million quarter-hour segments ("records") of 2010-13 programming carried pursuant to Section 119.[11] Dr. Gray sought NPM distant viewing information from Mr. Lindstrom for each of these 12.1 million records.

14.   Dr. Gray creates his analysis dataset by combining (1) the raw Lindstrom distant viewing data, (2) the Gracenote programming data[12], and (3) the Cable Data

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[10] One exception was WGN, which was retransmitted nationally.

[11] There are 12,081,142 records, 11,959,542 are compensable and 121,600 are non-compensable (the latter are all WGN records). See electronic file "041_comp.log".

[12] The programming (or broadcast-level) information gives details associated with the program broadcast during the quarter hour for the record, e.g., what was on KABC during 8:00pm-8:15pm on August 1, 2010. The information consisted of the title of the show, the episode title, how many minutes of the quarter-hour the show occupied, the "program type", and the date the program originally aired. Dr. Gray uses this information to classify the show as belonging to one of the four claimant categories. This broadcast-level data was provided to Dr. Gray by Gracenote. █████████████ ██ ██ █████ Dr. Gray classifies this as a (network) Program Suppliers broadcast. See electronic file "003_KABC.log".

Corporation (CDC) carriage[13] data.[14] As a first step in his analysis, Dr. Gray merges the Gracenote data and Lindstrom data together. In doing this merge, Dr. Gray excludes 11.8 percent of the Lindstrom data that does not merge to Gracenote data.[15] For these records, Dr. Gray has Lindstrom data but no Gracenote data.[16] Dr. Gray does not disclose this large-scale exclusion of data in his testimony. Nor does he explain what steps he took to understand the lack of matches between the Lindstrom and Gracenote data.

15. Of the remaining 12,081,142 records, Lindstrom provided NPM data to Dr. Gray for 6.5 percent (=781,821/12,081,142) of the records. Stated differently, Lindstrom had no NPM data for 93.5 percent (= 1 - 6.5%) of the records for which Gray was attempting to estimate viewing.

16. While Gray does not report those numbers in his written testimony, he does say that he "find[s] many quarter hours for many channels where no one in the Nielsen sample viewed programming carried on the channel"[17] in the NPM data he received.

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[13] The carriage (or station-level) information gives details associated with the station, such as the number of distant subscribers that received the station, the royalties paid to carry the station, and the city and state of the station. Using the example above, station-level information would be that the call sign is KABC, which is an ABC affiliate in Los Angeles, CA, had 369,512 total distant subscribers in August, all of which are residential distant subscribers (and thus zero commercial distant subscribers), and generated $1,130,426 in royalty fees for the year. This station-level data was provided to Dr. Gray by the Cable Data Corporation. See electronic file "003_KABC.log".

[14] Gray Testimony ¶ 42-47.

[15] 11.76% = 680,633/5,788,593. For the numerator and denominator, see electronic file "004_exclude.log".

[16] For example, for KARK in Little Rock, AR, the Lindstrom data estimate that between 9:30am-9:45am on April 29, 2010, there were ▮▮▮▮ households distantly viewing. However, Dr. Gray's Gracenote data does not report the broadcast on KARK during 9:30am-9:45am on April 29, 2010, and thus Dr. Gray does not know what these households were viewing. Without the program name and other relevant information, he cannot allocate the record to the appropriate claimant category. See electronic file "005_KARK.log". Dr. Gray chose to exclude records like this from his analysis.

[17] Gray Testimony ¶ 62.

17.   In those rare instances where the Lindstrom dataset contains data about viewership for a given program, the data are limited. Table 1 shows that, among the 12.1 million Gracenote records, 491,605 (4.1%) records report distant viewing of only a single Nielsen NPM household, and 290,216 (2.4%) records report distant viewing based on two or more Nielsen NPM households.[18] Thus, in total, 98.5 percent[19] of the records have either no NPM data or data showing viewing from only one or two NPM households.

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[18] See electronic file "006_gray_data_build.log".
[19] From my Table 1: 98.51% = 93.53% + 4.07% + 0.91%.

Table 1: Distant Viewing Household Counts (Unweighted) for all 12.1 Million
Records in the Lindstrom Data used in Gray Table 4, Model 1[20]

Nielsen NPM Households Reporting Distant Viewing	all	%	WGN	%	non-WGN	%
no data	11,299,321	93.53%	5,025	3.57%	11,294,296	94.59%
1	491,605	4.07%	8,531	6.06%	483,074	4.05%
2	109,988	0.91%	9,830	6.98%	100,158	0.84%
3	41,836	0.35%	10,012	7.11%	31,824	0.27%
4	22,597	0.19%	9,375	6.66%	13,222	0.11%
5	15,503	0.13%	8,889	6.31%	6,614	0.06%
6	12,082	0.10%	8,192	5.82%	3,890	0.03%
7	9,937	0.08%	7,420	5.27%	2,517	0.02%
8	8,386	0.07%	6,599	4.69%	1,787	0.01%
9	7,034	0.06%	5,982	4.25%	1,052	0.01%
10	6,436	0.05%	5,725	4.07%	711	0.01%
11	5,675	0.05%	5,252	3.73%	423	0.00%
12	5,139	0.04%	4,897	3.48%	242	0.00%
13	4,776	0.04%	4,648	3.30%	128	0.00%
14	4,483	0.04%	4,412	3.13%	71	0.00%
15	4,186	0.03%	4,121	2.93%	65	0.00%
16	3,962	0.03%	3,916	2.78%	46	0.00%
17	3,717	0.03%	3,683	2.62%	34	0.00%
18	3,431	0.03%	3,411	2.42%	20	0.00%
19	3,007	0.02%	2,990	2.12%	17	0.00%
20	2,817	0.02%	2,805	1.99%	12	0.00%
21	2,532	0.02%	2,522	1.79%	10	0.00%
22	2,315	0.02%	2,306	1.64%	9	0.00%
23	1,981	0.02%	1,971	1.40%	10	0.00%
24	1,663	0.01%	1,655	1.18%	8	0.00%
25	1,475	0.01%	1,462	1.04%	13	0.00%
26	1,188	0.01%	1,183	0.84%	5	0.00%
27	984	0.01%	978	0.69%	6	0.00%
28	778	0.01%	768	0.55%	10	0.00%
29	597	0.00%	592	0.42%	5	0.00%
≥ 30	1,711	0.01%	1,646	1.17%	65	0.00%
	12,081,142	100%	140,798	100%	11,940,344	100%

18.   With regard to data for stations other than WGN, Table 1 shows that, among

the 11.9 million Gracenote records for the Gray non-WGN analysis, 483,074 (4.05%)

records report distant viewing based on only a single Nielsen NPM household, and only

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[20] See electronic file "002_distant_tabulation.log". There are 122 records in the Lindstrom data where the NPM weighted viewing is reported as zero, these are included in the 11,299,321 records with no Lindstrom distant viewing data. See electronic file "006_gray_data_build.log".

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162,974 (1.36%) records report distant viewing are based on two or more Nielsen NPM households.[21] In total, 99.5 percent[22] of the non-WGN records have either no NPM data or data showing viewing from only one or two NPM households.

19.   The facts that (1) Dr. Gray requested NPM data for 12,081,142 Gracenote records but received no data for 93.5 percent of these records and (2) most records for which Lindstrom did have data were based on a single household raise the question as to whether there were sufficient NPM households in many geographic areas to measure viewing of the distantly retransmitted signal. Dr. Gray did not provide any information in his testimony or underlying discovery as to the number of NPM households that had access to the stations retransmitted pursuant to Section 119 during 2010-13. In response to discovery requests, however, counsel for Program Suppliers informed counsel for JSC that "other than information that may be contained in the National Reference Supplements produced at Bates No. PS-001796-2374, Dr. Gray and Mr. Lindstrom do not have data or other information regarding the universe of NPM sample homes that could have viewed each program included in Dr. Gray's study, including without limitation the Nielsen INTAB count."[23] The Nielsen Reference Supplements do not provide information about the number of NPM homes in the geographic areas where satellite carriers delivered the broadcast stations.

20.   Dr. Gray and Mr. Lindstrom provided no information regarding the universe of NPM sample homes that could have viewed each program. Because the Lindstrom data is based on a sample, disclosing information on how many households in the NPM sample

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[21] See electronic files "006_gray_data_build.log" and "002_distant_tabulation.log".
[22] From my Table 2: 99.48% = 94.59% + 4.05% + 0.84%.
[23] *See* E-mail from L. Plovnick to M. Kientzle (May 23, 2019).

could view each Section 119 signal is essential to evaluating whether the sample will effectively measure viewership of Section 119 signals. This is especially critical because the sample itself was not designed to measure viewership of Section 119 signals. There is no scientifically valid reason to rely upon sample data and not disclose the complete parameters of the sample.

21.   Unless there are sufficient NPM households in each geographic area to which the distant signals at issue were retransmitted, the NPM sample cannot provide a reliable estimate of distant viewing of the distantly retransmitted signals. In addition, reliability problems also arise if there are disproportionately too many NPM households in a given geography relative to the station being measured. Based on the Program Suppliers' response to JSC's inquiry on the subject, Dr. Gray has no way of knowing whether the data he received from Mr. Lindstrom is reliable for the purposes that Dr. Gray is using it. We do know that Nielsen itself will not use sampling results unless a minimum number of NPM households were available to view a given program.[24]

C. The Use of Nielsen's NPM Weights Renders the Lindstrom Data Unreliable for Estimating Viewing Among a Station's Distant Subscribers.

22.   Lindstrom provided Dr. Gray with Nielsen's NPM weights. The Nielsen NPM weights are designed to project from an NPM household to a national audience. As Nielsen explains, "[t]he weight of a sample member equals the number of members of the population that the sample member represents. For example, if a sample member has an

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[24] Nielsen National Reference Supplement 2012-13 at 6-3 (Bates Nos. PS-002182-2374).

assigned weight of 20,000 for a particular day, it means that the viewing for that person on that day represents the viewing of 20,000 people in the United States."[25]

23.   But with the exception of WGN, distant signals are not retransmitted on a national basis. For example, Gray's data show that half of the stations in 2010 reached fewer than 7,900 distant subscribers.[26]

24.   In order to test whether the NPM weights can be used to generate reliable estimates of distant viewing, we compared the results of applying the NPM weights to the Lindstrom data for a given station to the number of satellite distant subscribers for the same station. Logically, the weighted Lindstrom data estimates of a station's distant viewing for any program cannot be larger than the number of distant subscribers for the station. Put simply, if the estimate of distant viewers is larger than the number of distant subscribers, then the data is untrustworthy and will not provide reliable estimates of distant viewing shares.

25.   The Lindstrom data (2010-13) show that there are 347 station-years for which there is at least one record that has positive distant viewing.[27] We compared the Lindstrom estimates of distant viewing households to the total distant satellite household

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[25] Nielsen Audience Watch User Guide, Version 7.2.5, 6-127. https://www.nielsen.com/wp-content/uploads/sites/3/2019/04/AW-UserGuide.pdf.

[26] See electronic file "025_subs.log". The figure is based on taking the average monthly subscribers for those months in which subscribers exist.

[27] See electronic files "026_reg_counts.log" and "009_summary.log". There were 98, 90, 88, and 71 stations in 2010, 2011, 2012, and 2013 respectively with at least one record of positive distant viewing. In Dr. Gray's analysis data sets for 2010, 2011, 2012, and 2013, there were 113, 100, 100, and 82 total stations, respectively. In the CDC data used by Dr. Gray, there were 119, 105, 100, and 82 total stations for 2010, 2011, 2012, and 2013, respectively. Using 2010 as an example, there are 119 stations in the CDC data. Six of these stations do not merge with the broadcast or viewing data. Of the remaining 113 stations, 15 have no records with positive distant viewing. The remaining 113-15=98 stations contribute whatever positive distant viewing there is to Dr. Gray's regression analysis used to generate his Table 4.

subscribers for these stations. We found that 55.4 percent (=190/343) of the non-WGN stations had a Lindstrom distant viewing estimate that was larger than the number of distant subscribers to the station, which is logically impossible and demonstrates that the Lindstrom data are unreliable and untrustworthy when used to estimate distant viewing in this case.[28] In total, there are approximately 46,000 records in Dr. Gray's data where, impossibly, the Lindstrom estimates of distant viewing households are larger than the total distant subscribers for a station (subscribers refers to households, and not individuals within a household).[29]

26.   Figures 1-3 illustrate the problem created by the use of NPM weights. Figure **1** shows the ratio of the maximum Lindstrom distant viewing estimate for a station divided by the station's total distant subscribers for the corresponding month in 2010 (see Appendix C for figures for 2011-2013). The stations are sorted from the station with the fewest average monthly subscribers (WJRT with 340 average monthly subscribers) on the left to the stations with the largest average subscribers (WPIX with 1,704,139 average monthly subscribers) on the right. The Lindstrom data estimate maximum viewing levels that are greater than the total number of distant subscribers for 58 percent of these stations (=56/97).[30]

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[28] See electronic file "012_summary.log". If we count the four years of WGN the ratio is 190/347=54.8%.

[29] See electronic file "012_summary.log". For 2010, 2011, 2012, and 2013 respectively, there were 17,147, 11,154, 11,934, and 5,659 such records giving a total of 45,894 such records.

[30] See electronic file "012_summary.log".

Figure 1: Ratio of Maximum Lindstrom Estimates of Distant Viewing Households
Divided by Distant Subscribers by Station for 2010
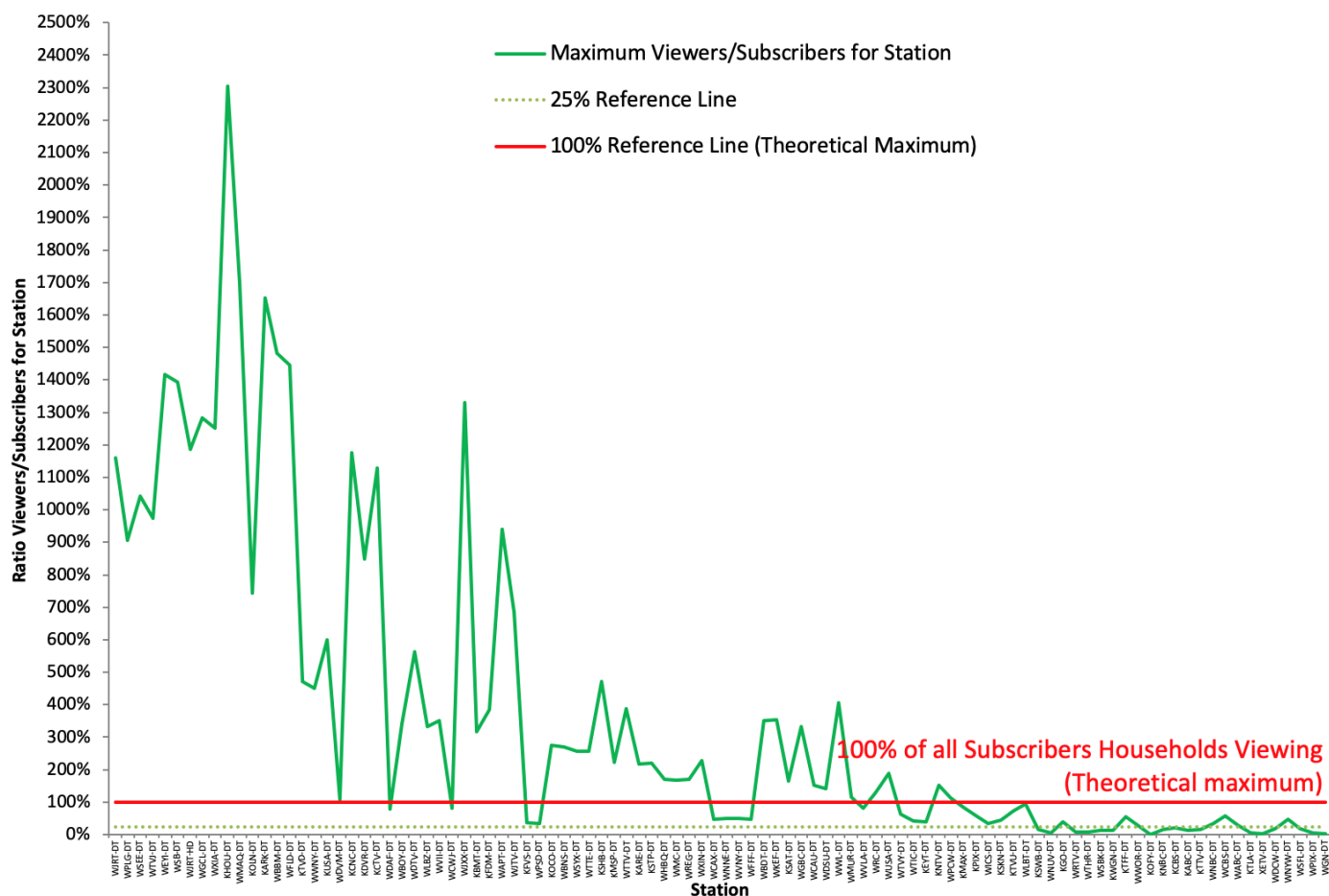
27.   Figure **2** is the same as Figure 1 except that it evaluates the ratio of the

minimum Lindstrom distant viewing estimate for a station divided by the station's total

distant subscribers for the corresponding month in 2010 (see Appendix C for figures for

the maximum, minimum and average viewing 2011-2013). It shows the same pattern of

impossibly high estimates of distant viewing. Figure **2** shows that for 27 (28%=27/97)

stations, every Lindstrom data viewing estimate exceeds the total number of distant

subscribers.[31]

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[31] See electronic file "012_summary.log".

Figure 2: Ratio of Minimum Lindstrom Estimates of Distant Viewing Households
Divided by Distant Subscribers by Station for 2010
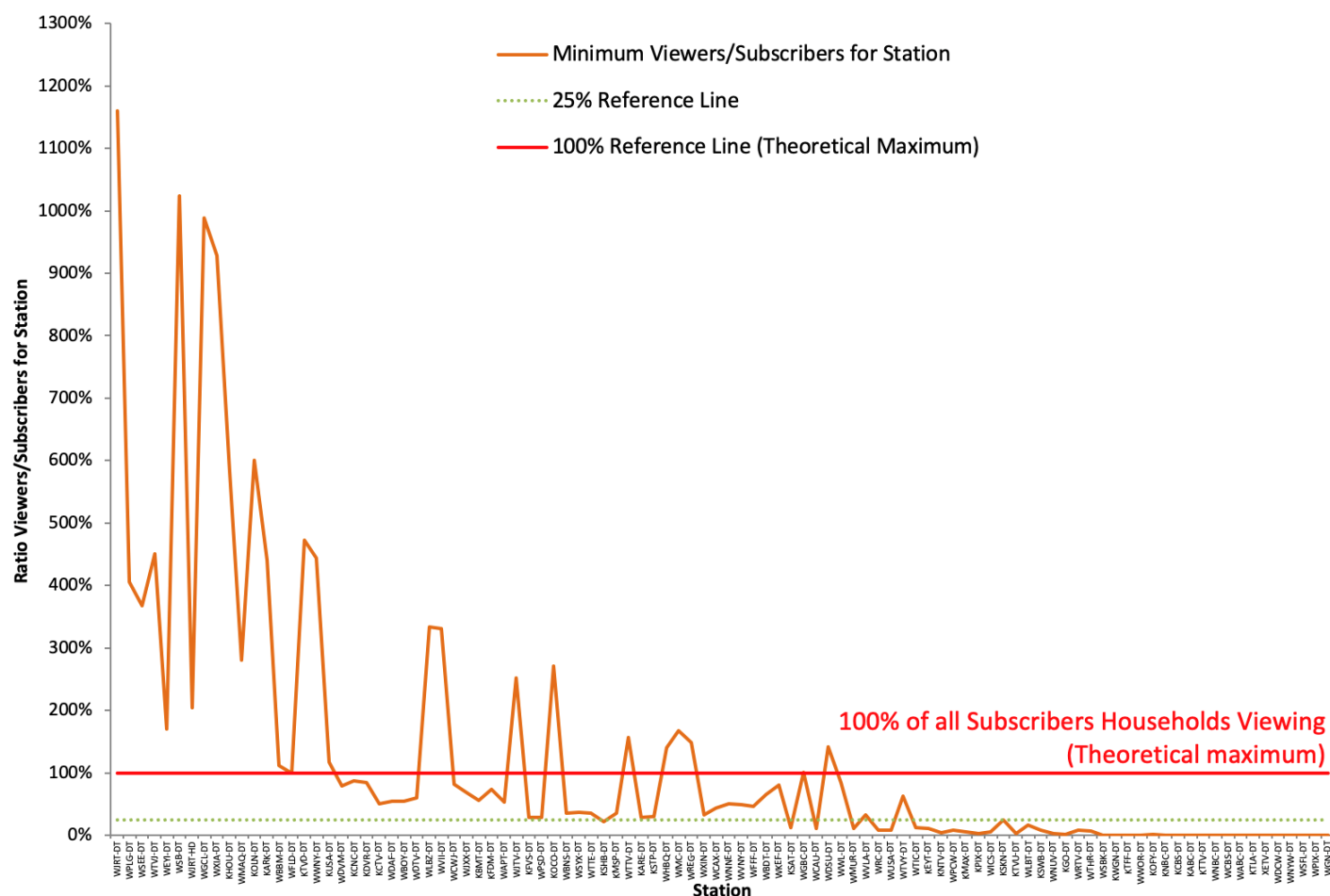
28.   The problem of impossibly high estimates created by the use of the NPM

weights is particularly acute for small stations. For example, in the 2010-2013 period,

among stations with fewer than 5,000 total distant subscribers, 88.3 percent of all

Lindstrom distant viewing estimates are larger than the total number of subscribers; among

this same group of stations, there were only 0.8 percent of Lindstrom distant viewing

estimates where the percent of subscribers viewing a program (i.e. Lindstrom distant

viewing estimates / total distant subscribers) was less than 50 percent[32] (Nielsen has

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[32] See electronic file "014_ratios.log".

reported that the Super Bowl, by contrast, had about 46 percent of potential viewing households watching during 2010-13[33]).

29.   In some instances, use of the NPM weights results in the Lindstrom data estimating impossibly large (viewing greater than subscribership) for every single record for a given station. For example, Figure **3** shows all of the 3,560 Nielsen estimates for distant viewing for WSEE in 2010 (see red triangles on chart).[34] See Appendix K for more examples.

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[33] Nielsen reports that between 45 percent and 47.1 percent (about 46 percent on average) of TV households watched the Super Bowl each year during 2010-2013. Nielsen, Super Bowl XLVII Draws 108.7 Million Viewers, 26.1 Million Tweets (Feb. 5, 2013), https:// www.nielsen.com/us/en/insights/article/2013/super-bowl-xlvii-draws-108-7-million-viewers-26-1-tweets/.

[34] The most extreme Lindstrom data distant viewing estimate for WSEE is for the program "THE MENTALIST" on September 2, 2010, which Lindstrom estimates was viewed by ▮▮▮▮ households. That is 10.4 (= ▮▮▮▮▮▮) times as many households as actually received the signal under Section 119. For WSEE in 2010, the estimate of distant viewing is always at least 3.68 times the number of Section 119 subscribers. See electronic file "015_WSEE.log".

Figure 3: Nielsen Estimates of Distant Viewing Households
versus Distant Subscribers for WSEE 2010
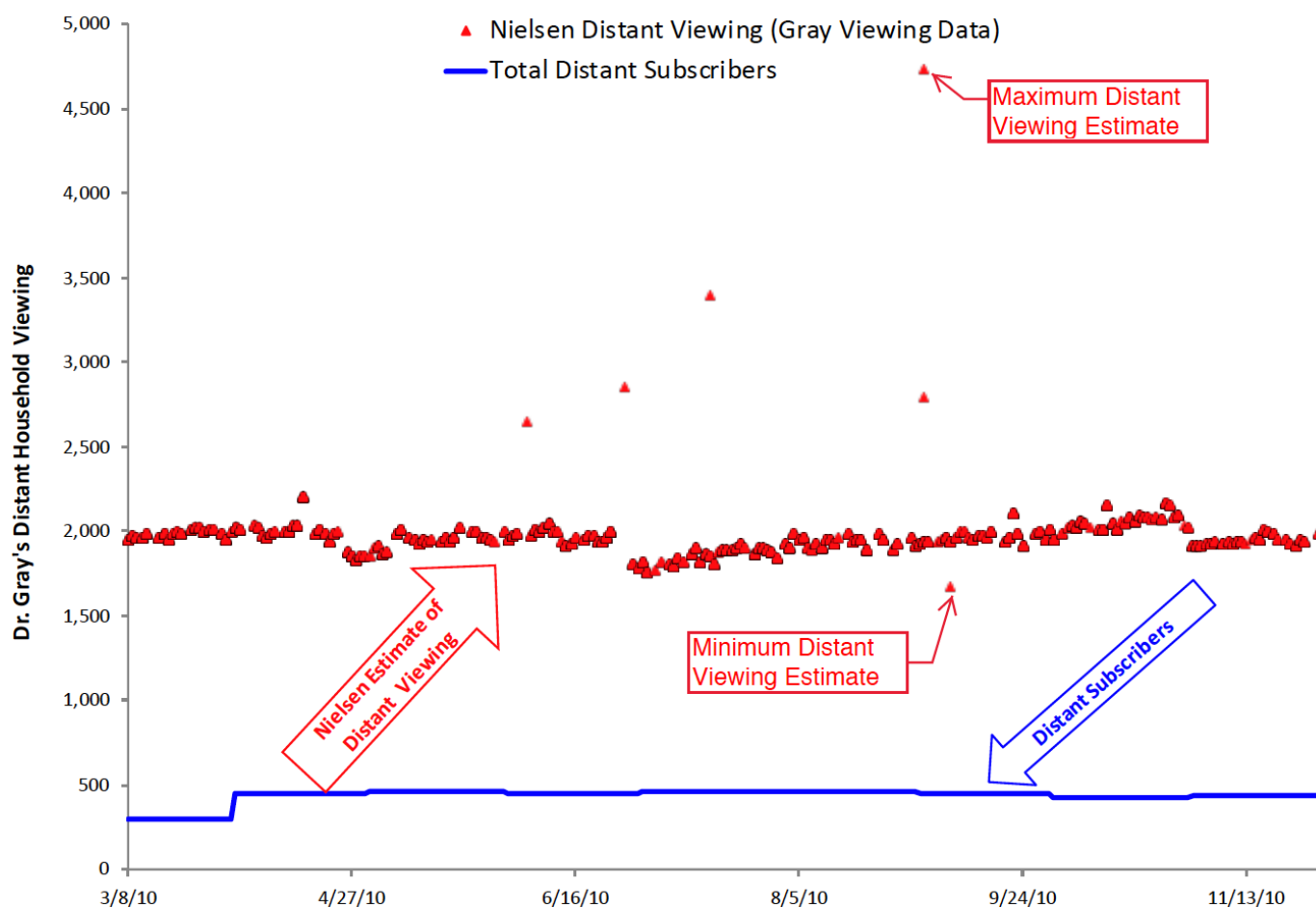
30.   Similar problems exist for stations with fewer than 10,000[35] and 20,000[36]

total distant subscribers. The problem of impossibly large estimates of viewing using the

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[35] Overall for 2010-2013, among stations with fewer than 10,000 total distant subscribers, 82.3 percent of all Lindstrom distant viewing estimates are larger than the total number of subscribers; among this same group of stations, there were only 10.5 percent of Lindstrom distant viewing estimates where the percent of subscribers viewing a program (i.e. Lindstrom distant viewing estimates / total distant subscribers) was less than 50 percent. See electronic file "014_ratios.log".
[36] Overall for 2010-2013, among stations with fewer than 20,000 total distant subscribers, 63.1 percent of all Lindstrom distant viewing estimates are larger than the total number of subscribers; among this same group of stations, there were only 16.4 percent of Lindstrom distant viewing estimates where the percent of subscribers viewing a program (i.e. Lindstrom distant viewing estimates / total distant subscribers) was less than 50 percent. See electronic file "014_ratios.log".

Lindstrom data significantly decreases and then disappears as the size of the station grows.[37,38]

31.   Figure **4** shows every Lindstrom distant viewing estimate divided by the station's distant subscribers for 2010 (see Appendix D for 2011-2013). This figure visually demonstrates the bias inherent in the raw Lindstrom data, namely, that smaller stations have impossibly large Nielsen viewing estimates while larger stations get much smaller viewing estimates. The Lindstrom data will not produce trustworthy estimates of relative viewing because of this bias. Dr. Gray does nothing to correct this fundamental problem in the Lindstrom data.

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[37] Overall for 2010-2013, among the 72 stations with more than 100,000 average monthly distant subscribers for the year, only 2 have Lindstrom distant viewing estimates that are larger than the total number of subscribers. There are, however, some larger stations with impossibly large Lindstrom distant viewing estimates. For example, WCBS had 382,745 distant subscribers in December 2012. Dr. Gray includes in his regression analysis a Lindstrom distant viewing estimate (on December 14, 2012) for the daytime soap "The Bold and the Beautiful" of ▐▐▐▐ distant viewers — this viewing estimate finds ▐▐▐▐ (=▐▐▐▐▐▐▐▐) more distant viewers than distant subscribers. See electronic file "018_WCBS.log".

[38] Overall for 2010-2013, among stations with more than 1,000,000 total distant subscribers (9 stations across 2010-2013: WGN and WPIX for each of 2010-13, and WSFL in 2011), there is not a single example where a Lindstrom distant viewing estimate is larger than the total number of subscribers. In fact, among these stations there are 177,059 Nielsen records with distant viewing estimates (these represent 23 percent of the total Lindstrom distant viewing data); for these records, the maximum ratio of distant viewing divided by distant subscribers is only 7.6 percent. See electronic file "014_ratios.log".

Figure 4: Ratio of Lindstrom Distant Viewing Estimates Divided by
Total Distant Subscribers for 2010[39]
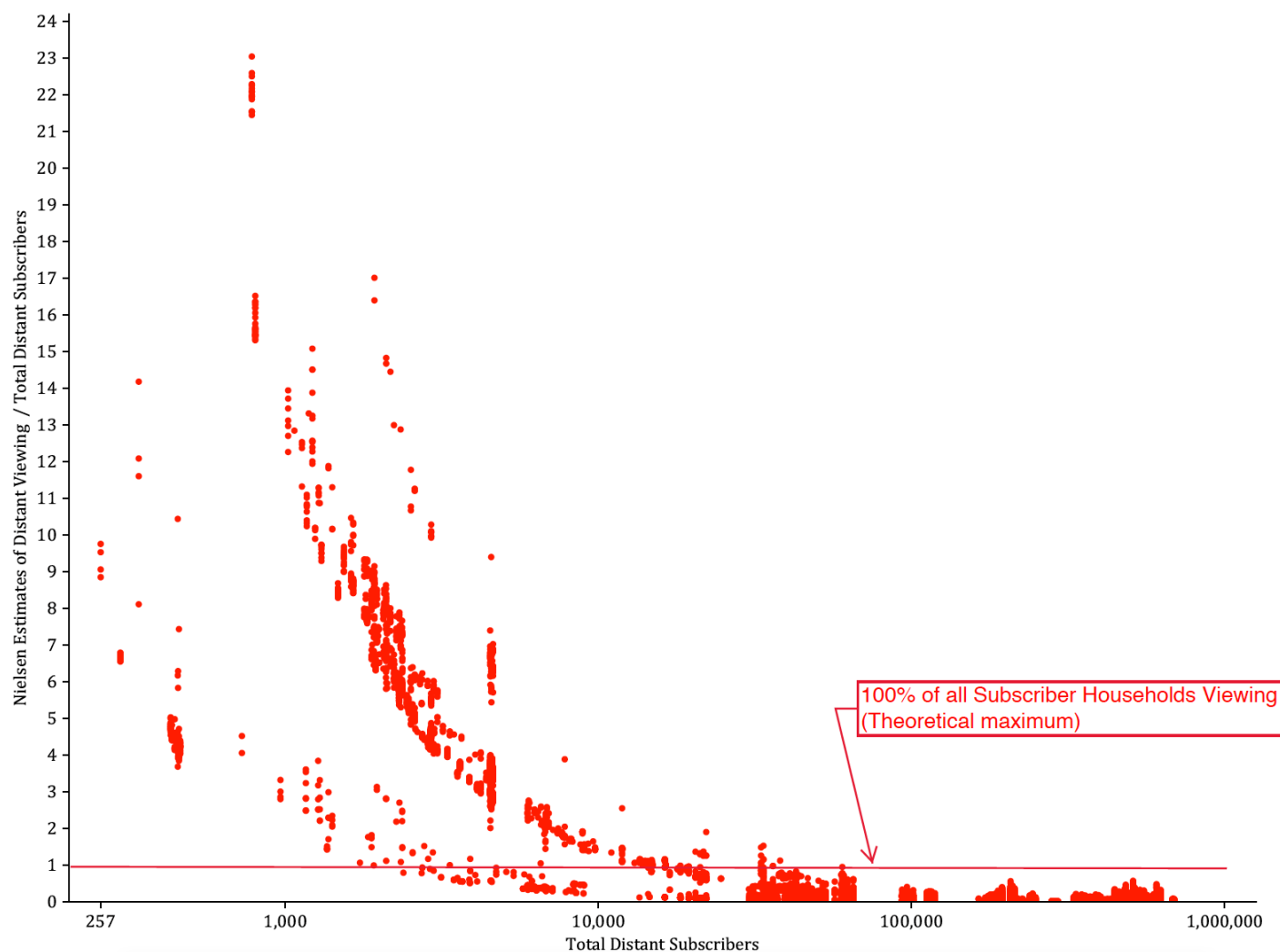
32.   The impact of these impossibly high estimations can be seen by looking at paid programming (infomercials). For example, there are 326 paid programming records in the Lindstrom data for which the distant viewing estimate is larger than the total distant subscribers (see Appendix E).[40] These include:[41]

- WAPT had 4,543 total distant subscribers but at 1:45am on October 25, 2011 there were ██████ households distantly watching the paid program "████████ ████████████████████".

- WHEC had 454 total distant subscribers but on <u>September 4, 2011 there were</u> ███████ households distantly watching the paid program "███████ ███████".

- WCAU had 27,202 total distant subscribers but on <u>May 4, 2013 there were</u> ███ households distantly watching the paid program "███████ ███████.

33.   If the Lindstrom data were to be believed, these infomercials in the middle of the night have viewing rates many times greater than the Super Bowl. Nielsen reports that between 45 percent and 47.1 percent (about 46 percent on average) of TV households viewed the Super Bowl each year in 2010-2013.[42] The Lindstrom data reports that more than 76,600 records (10 percent of Lindstrom distant viewing records) had viewing rates[43] greater than Super Bowl viewing (Appendix L, Table L).[44]

34.   As the above demonstrates, application of the NPM weights to the raw Lindstrom data produces unreliable and indeed impossible estimates of viewing.[45]

IV.   DR. GRAY'S REGRESSION ANALYSES IN HIS "VIEWING STUDY" DO NOT AND CANNOT CURE THE INADEQUICIES WITH THE UNDERLYING LINDSTROM VIEWING DATA

35.   Dr. Gray does not base his Table 4 estimates directly on the data provided by Lindstrom. Instead, Gray relies on a "viewing regression methodology" (which he also refers to as his "enhanced" viewing methodology) that uses the Lindstrom data, Gracenote data and CDC data as inputs to predict the values reported in his Table 4.[46]

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[42] Nielsen, Super Bowl XLVII Draws 108.7 Million Viewers, 26.1 Million Tweets (Feb. 5, 2013).
[43] Lindstrom NPM distant viewing / distant subscribers.
[44] See electronic file "031_calculation.log".
[45] This is not to suggest that Dr. Gray should abandon the use of weights altogether. Rather, it illustrates the importance of developing weights that are appropriate for the estimation being performed.
[46] Gray Testimony ¶ 63.

36.   Dr. Gray claims that his "viewing regression methodology" allows him to accurately estimate "subscriber demand" (i.e., distant viewing) for every individual program broadcast, for every program type, on every station, for 2010 through 2013.[47]

A. Gray's Regression Analyses Cannot Solve the Problems with The Underlying Data

37.   As an initial matter, the outputs of a regression analysis are only as good as the quality of the input data used by the regression. Gray's regression analyses estimate the relationship between the independent variables and the dependent variable (i.e., distant household viewing). They do not correct deficiencies or errors in the data used by Gray. Dr. Gray's multiple regression techniques do not and cannot compensate for the sparsity of data in the Lindstrom dataset or for the problems created by applying the national NPM weights to distant viewing. It is well understood that statistical and economic models that are based on unreliable, biased or inappropriate data will yield unreliable, biased and misleading estimates.[48]

B. The Gray Regression Models Are Virtually Identical to the Models Gray Used in the 2010-13 Cable Allocation Proceeding

38.   Dr. Gray claims that his regression analyses are "far more than just raw estimated viewing data" and is importantly different from estimates he would get had he only used the raw Lindstrom data:

> My valuation methodology relies on *far more* than just raw estimated viewing data. It relies on *additional non-viewing factors*, which further

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[47] Gray Testimony ¶¶ 8, 21, 36, 37, 40, 60, 65, 66, 76.
[48] Statistical Analysis for Decision Makers in Healthcare, 2nd Ed, Jeffrey C. Bauer; Applied Regression Analysis, Second Edition, Norman R. Draper & Harry Smith, 1981, p. 418; Edmund C. Berkeley, Right Answers — A Short Guide for Obtaining Them, Computers and Automation Vol 18, Number 10, September 1969 (p. 20); Essential Statistics, Regression, and Economics, Gary Smith; Naked Statistics: Stripping the Dread from the Data, Chapter 7, Charles Wheelan, 2014; The Data Science Design Manual, Skiena, 2017; Applied Data Mining for Forecasting Using SAS, Rey, 2012.

enhance the regression analysis itself and the resulting estimates. I refer to the resulting program valuation estimates as "enhanced viewing" measures of the relative market value of programing in order to distinguish my valuation methodology from raw estimated viewing data.[49]

39. Dr. Gray's Table 4 presents three different model estimates of the distant viewing share (Dr. Gray explains that Model 1 is his preferred model[50]). The mathematical structure of the regression models (i.e., enhanced viewing methodology) is the same for each of Dr. Gray's three models. Dr. Gray explains that his regression model attempts to establish a mathematical relationship between the raw Lindstrom distant viewing data (i.e., the dependent variable) and three independent variables:

- Total number of **distant subscribers**[51] (the number of distant subscribers in the Gray data ranges from 11 subscribers to 1.8 million subscribers for non-WGN stations[52]).[53]
- The **time of day** the program aired by quarter hour (there are 96 quarter hours in a day[54]).

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[49] Gray Testimony ¶ 37. Emphasis added.

[50] Gray Testimony ¶ 102.

[51] Dr. Gray's Appendix C purportedly shows the "Distant Subscribers" for each station in 2010-2013 but this is incorrect. The Gray Appendix C estimates labeled "Distant Subscribers" are, in fact, the totals of royalties associated with the stations and not distant subscribers. For example, Dr. Gray reports that WJRT-DT had 85 "Distant Subscribers" in 2010; WJRT-DT had $85 in royalties associated with it and it had 340 distant subscribers in June 2010 and no distant subscribers in any other months. Appendix H in this report shows the average distant subscribers by station and year use in the Gray regression analyses.

[52] See electronic file "020_subs.log".

[53] In addition to the overall sparsity of data, the Lindstrom data suffer from an additional problem. Dr. Gray estimates (in Gray Table 3) that there were 1,823,315,201 subscriber-weighted hours of compensable distant broadcasts that were received by *commercial* satellite subscribers. See electronic file "008_commercial.log". The Lindstrom viewing data, however, only include data on *residential* viewing — they contain no data on *commercial* subscriber viewing. The Gray Table 4 estimates, therefore, are unreliable estimates of commercial distant viewing because Dr. Gray has no data on commercial viewing. If, for example, commercial subscriber viewing is predominantly sports and news, then the Gray methodology will be biased because it will not take this into account and will instead estimate that commercial subscribers watch the same types of programs as residential subscribers and will understate the distant viewing of sports and news among commercial subscribers.

[54] The first quarter hour is the midnight-12:15am time period. The second quarter hour is the 12:15am-12:30am time period, and so on. The 96th and final quarter hour is the 11:45pm-midnight time period. As another example, the 81st quarter corresponds to the 8:00pm-8:15pm time period. The Gray model includes a time of day variable (which quarter hour of the day the program was broadcast) but this is only a crudely measured variable. Dr. Gray only identifies the quarter hour of the day and ignores the day of the week and day of the year. He, for example, ignores that

- The **program type** (there are 30 different program types).[55]

40.　　Figure **5** shows the line in the Gray computer code which illustrates that the Gray analyses for Table 4 use only three variables in its attempt to predict distant viewing.[56]

Figure 5: Gray "Enhanced" Viewing Model
(Regression Analysis Command from Gray Computer Code)
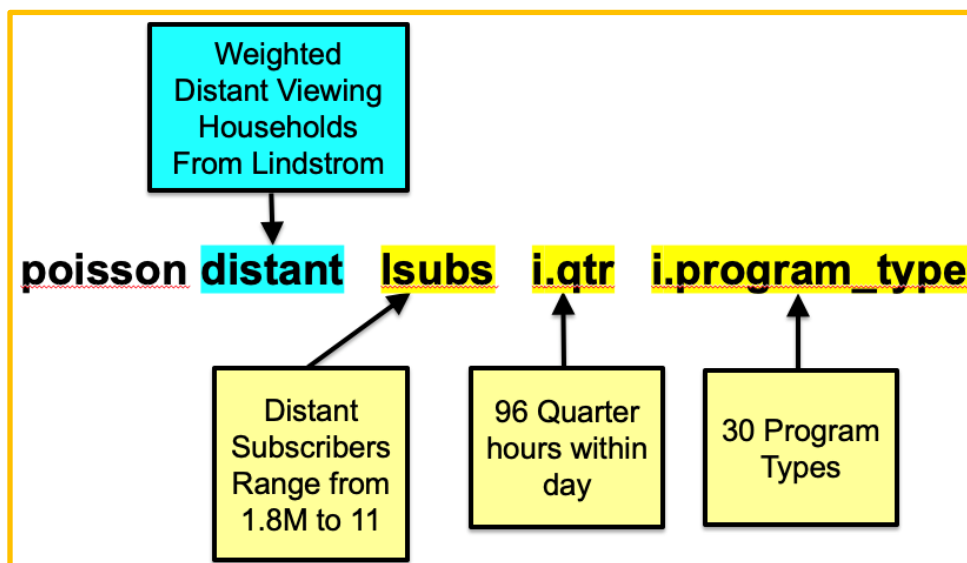
41.　　Dr. Gray does not explain the basis for his claim that this regression model is "enhanced" especially considering that this current model has one fewer variable than the model he used in the cable proceedings. In the 2010-13 cable proceeding, Dr. Gray used a regression model with four variables: these same three variables plus his variable for local ratings.[57] In other words, the model Dr. Gray now calls "enhanced" is essentially

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viewing on a Thursday in September at 9pm can be different from viewing from a Saturday in July at 9pm. He also, for example, claims his variable can capture the effect of increased viewing during "prime-time" but this variable is limited because it (1) does not distinguish prime-time of different days of the week (there is no difference between Thursday, Monday or Saturday nights for example), and (2) it does not recognize that prime-time in the Midwest (i.e., Central Time Zone) starts at 7pm and ends at 10pm while prime-time on the coasts starts at 8pm and ends at 11pm.

[55] See electronic file "042_program_type.log".

[56] In both the cable and satellite regression analyses, Dr. Gray uses broadcast minutes ("min") as a frequency weight.

[57] *See* Testimony of Dr. William E. Wecker and R. Garrison Harvey, Docket No. 14-CRB-0010-CD (2010-13) (Sept. 15, 2017) (JSC Ex. 25); William E. Wecker, Associates, Inc., Analysis of Written Direct Testimony of Jeffrey S. Gray, Ph.D., Docket No. 14-CRB-0010-CD (2010-13) (Sept. 15, 2017) at ¶ 28 (JSC Ex. 26).

the same model as he presented in the 2010-13 Cable Proceeding minus the local rating variable, as shown by Figure 6.[58]

Figure 6: Gray Viewing Model from 2010-13 Cable Allocation Proceeding
(Regression Analysis Command from Gray Cable Computer Code)
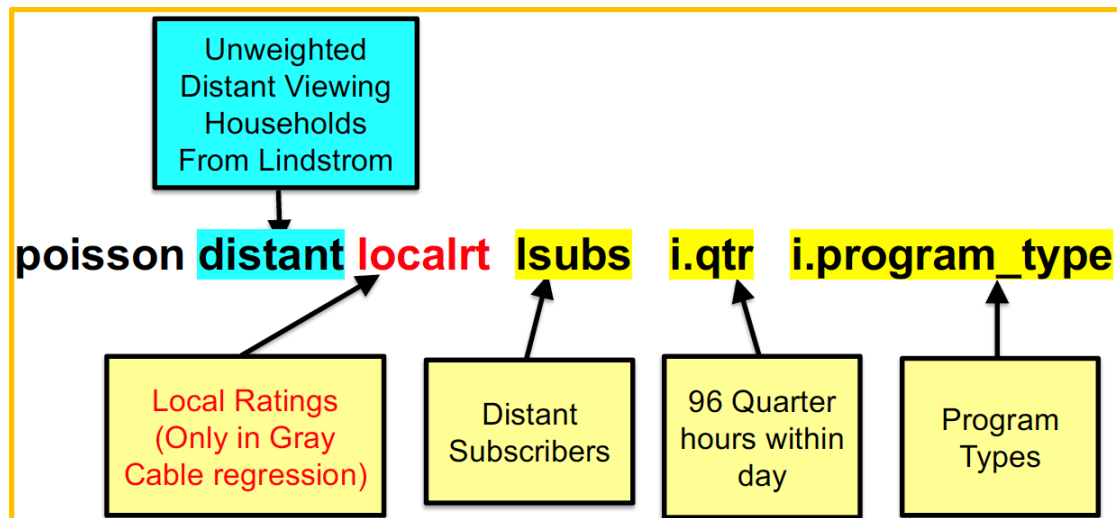
42.   Dr. Gray uses all three independent variables in his current model to attempt to estimate distant viewing. The model is not predicting anything other than distant viewing and the average distant viewing shares predicted by this Gray model are essentially the same averages as in the raw Lindstrom data.[59]

C. Dr. Gray's Model Performs No Important Role in his Distant Viewing Shares Estimates

43.   Dr. Gray's claim that his enhanced model is "far more than just raw estimated viewing data" can be tested by comparing the share estimates based only on the raw Lindstrom distant viewing data with the Gray share estimates based on his "enhanced" model. Table 2 shows the distant viewing share estimates based on the raw Lindstrom data compared to the Gray distant viewing estimates based on his enhanced model (Gray Table

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[58] In a change from his cable analysis, Dr. Gray now combines compensable and non-compensable records in the WGN regression analysis. *See infra* Section IV.E.

[59] See electronic file "062_table2.log".

4, Model 1). Dr. Gray analyzes data from WGN separately from data for all other non-WGN stations, and so those results are set forth separately. Table 2 shows that the Gray enhanced viewing model estimates are not materially different from the simple share estimates derived directly from the raw Lindstrom data. Dr. Gray's enhanced viewing model, therefore, simply echoes back the share estimates found using the raw estimated viewing data.

Table 2: Distant share estimates based only on the raw Lindstrom distant viewing data compared to the Gray share estimates based on his "enhanced" model[60]

Year	Cat	Data and Model for WGN			Data and Model for Non-WGN		
		Raw Lindstrom Estimates	Gray Enhanced Estimates	Diff	Raw Lindstrom Estimates	Gray Enhanced Estimates	Diff
2010	Com	40.05%	39.92%	-0.14%	10.22%	10.90%	0.68%
2010	Dev	1.49%	2.38%	0.89%	0.21%	0.46%	0.26%
2010	PS	18.00%	17.48%	-0.52%	80.86%	80.10%	-0.76%
2010	JSC	40.46%	40.22%	-0.24%	8.71%	8.53%	-0.18%
2011	Com	49.66%	49.23%	-0.43%	12.48%	14.12%	1.65%
2011	Dev	0.95%	1.94%	0.99%	0.10%	0.38%	0.27%
2011	PS	5.94%	5.81%	-0.13%	79.29%	77.46%	-1.83%
2011	JSC	43.45%	43.02%	-0.43%	8.13%	8.04%	-0.09%
2012	Com	52.85%	53.00%	0.14%	11.76%	14.77%	3.02%
2012	Dev	0.21%	0.13%	-0.08%	0.12%	0.25%	0.13%
2012	PS	5.65%	6.30%	0.66%	80.38%	77.22%	-3.16%
2012	JSC	41.29%	40.57%	-0.72%	7.74%	7.76%	0.01%
2013	Com	54.29%	54.33%	0.04%	12.50%	14.09%	1.59%
2013	Dev	0.05%	0.03%	-0.02%	0.06%	0.19%	0.13%
2013	PS	6.01%	5.96%	-0.05%	80.50%	78.85%	-1.64%
2013	JSC	39.65%	39.68%	0.03%	6.94%	6.87%	-0.07%
2010-13	Com	48.90%	48.76%	-0.14%	11.69%	13.40%	1.71%
2010-13	Dev	0.71%	1.20%	0.49%	0.12%	0.32%	0.20%
2010-13	PS	9.10%	9.09%	-0.01%	80.28%	78.45%	-1.83%
2010-13	JSC	41.29%	40.95%	-0.34%	7.91%	7.82%	-0.09%

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[60] Data in table is limited to the records that Dr. Gray uses to estimate his regression analyses. See electronic file "062_table2.log".

D. Dr. Gray's "Enhanced" Viewing Methodology is Biased Because it Overstates the Distant Viewing of Smaller Stations Compared to Larger Stations

44.   Figure **1**, Figure **2** and Figure **4** above graphically demonstrate that not only are the Lindstrom data unreliable and ill-suited to estimate distant viewing for the stations at issue in this case, but the overstated distant viewing bias is particularly problematic among the smaller stations. Not surprisingly, Dr. Gray's regression echoes this bias — the Gray regression does not fix the errors and biases in the Lindstrom data. Figure 7 is a similar chart to Figures 1 and 2, except instead of showing the raw Lindstrom distant viewing estimates, it shows Dr. Gray's average estimated distant viewing (based on his "enhanced" viewing methodology (Gray Table 4, Model 1)).   See Appendix R for 2011-2013 figures. Dr. Gray estimates distant viewing for 113 stations in 2010. This figure shows all 113 stations sorted from the station with the fewest average subscribers (KTOA with 177 average subscribers) on the left to the stations with the largest average subscribers (WGN with 22,016,076 average subscribers) on the right.

45.   Figure 7 illustrates a fundamental problem in the Gray "enhanced" viewing methodology — it is biased and will inflate the distant viewing estimates of smaller stations as compared to larger stations. For example, Dr. Gray estimates that the average viewing on KOTA (5.81% average viewing with only 177 average subscribers) is 13.4 times larger than for WPIX (0.43% average viewing with 1,704,139 average subscribers).[61] The Gray model estimates are unreliable and untrustworthy because of this built-in bias.

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[61] See electronic file "043_fig7.log".

Figure 7: Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2010)

E. Dr. Gray's Regression Methodology Cannot "distinguish between the varying levels of value of bundled programming on the same signal"

46.   Dr. Gray opines that "[a]ny reliable methodology should be able to distinguish between the varying levels of value of bundled programming on the same signal. My enhanced viewing methodology accomplishes this task."[62] We have tested this claim by comparing the results of Dr. Gray's study when non-compensable programming is included and when it is not.

47.   WGN is the only station with non-compensable programming. Unlike his analyses in the 2010-13 cable proceeding (where Dr. Gray only analyzed compensable WGN programming), Dr. Gray now combines compensable and non-compensable records

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[62] Gray Testimony ¶58.

in the WGN regression analysis. Dr. Gray estimates his WGN regression analyses including both compensable and non-compensable programming. Dr. Gray then uses these regression estimates to predict distant viewing for only compensable programming in his Table 4 Distant Viewing estimates. The non-compensable WGN programming, there is used to estimates the regression, but is not directly used in the Gray Table 4 estimates.

48.   Appendix M, Table M shows a comparison of the Gray Table 4 (Model 1) distant viewing estimates where (1) the WGN regression analysis includes both compensable and non-compensable programs (i.e., the Gray method) versus (2) WGN regression analysis including only compensable programs. Appendix M, Table M demonstrates that the distant viewing share estimates are essentially the same (i.e., no estimates change by more than 0.20%) regardless of whether the non-compensable WGN programs are included or excluded from the Gray analysis.[63] There is no evidence that Gray's decision to include non-compensable WGN programs has any effect on the share estimates.

49.   As another test of the Gray WGN regression analysis, we analyzed his model's estimates of distant viewing of compensable and non-compensable programming on WGN. As explained above, while Dr. Gray includes non-compensable WGN programming when estimating his WGN regression, he does not report any estimates of viewership of non-compensable programs on WGN in his Table 4. Logically, however, if his methodology works as he claims, it should be equally capable of estimating viewership to the non-compensable programming on WGN.

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[63] See electronic files "044_table4.log", "045_table4_comp.log", and "046_table4_comp.log".

50.   When used to estimate distant viewership to all programming on WGN, we found that the Gray WGN model estimates that paid programming on WGN has a higher share of viewership than JSC programming for 2012 and 2013. Specifically, the Gray model estimates that paid programming had a viewing share of 5.7 percent compared to 5.5 percent share for JSC in 2012 and that paid programming had a viewing share of 5.9 percent compared to 5.0 percent share for JSC in 2013 (including both compensable and non-compensable WGN viewing).[64] We understand that this prediction is contrary to the fact that MVPDs place no value on paid programming and substantial value on JSC programming.[65]

F. Dr. Gray's Regression Analyses Fail a Goodness of Fit Test

51.   Dr. Gray's "viewing" methodology relies on a Poisson regression analysis to analyze the Lindstrom data and to make predictions for particular shows for each Section 119 station. We performed a goodness of fit test, using the same software used by Dr. Gray, to determine if a Poisson regression is appropriate to analyze the data and if the analysis method fits the data well.

52.   We found that the Poisson methodology is not appropriate and should not be used. The Gray "enhanced" viewing regression model does not fit that data well. Dr. Gray used a computer program called STATA to estimate his Poisson regression. The STATA manual states that if the model fails the goodness of fit test then the "Poisson regression model is inappropriate."[66] Dr. Gray did not produce any documentation indicating that he performed a goodness of fit test on his model, but we did perform this

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[64] See electronic files "227_table4_split.log" and "227a_table4_split.log".
[65] *E.g.*, Written Rebuttal Testimony of Daniel M. Hartman, Docket No. 14-CRB-0011-SD (2010-13) (Aug. 26, 2019) at ¶ 12; Written Direct Testimony of David Shull, Docket No. 14-CRB-0011-SD (2010-13) (June 7, 2019) at ¶ 28.
[66] https://www.stata.com/manuals13/rpoissonpostestimation.pdf (Appendix G).

test in accordance with the directions in the STATA manual. The Gray Poisson regression model fails this test, therefore, there is less than a one in a million chance that Dr. Gray's "enhanced" viewing methodology is appropriate and reliable when applied to the Lindstrom NPM data.[67]

G. Gray's Unfounded Assumptions When Employing Lindstrom Data in His Regression

53.   In order to execute his regressions, Gray had to decide how to address the fact that the Lindstrom dataset lacked viewership data for more than 93 percent of the compensable quarter-hours of programming for stations at issue. If a station had no Lindstrom distant viewing records for the year, then Dr. Gray assumes that all distant viewing records for the year are missing; these records do not enter his regression analysis. If, on the other hand, a station has even one single Lindstrom distant viewing record, then Dr. Gray assumes all the other records in the year with no Lindstrom distant viewing data should be recoded as zero distant viewing.[68] In other words, where the Lindstrom data contained any positive record of household distant viewing for at least one compensable quarter-hour broadcast for a given station, Gray deemed the data for all quarter-hours of all compensable broadcasts for that station in the year to be complete and then assumed

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[67] For each year 2010-2013 and each regression, using a Pearson goodness-of-fit test or a deviance goodness-of-fit test, the p-value to fifteen decimal places is 0.000000000000000. *See* electronic file "047_gof.log".

[68] Gray Testimony ¶ 64, "I treat, as recorded, estimated raw distant viewing of programs in each instance where a program on a distantly retransmitted channel is watched by a Nielsen household, on a distant basis, during any quarter hour over the year. I treat, as non-recorded distant viewing, those same quarter hours where there is no positive viewing of a program. If the channel is never viewed on a distant basis throughout the year, I treat each quarter hour as having no information on distant viewing levels."

that the absence of data for any given quarter-hour period should be coded as zero viewership.[69] Gray does not explain the basis for his assumptions.

54.   Table 3 shows there were 11,299,321 Gracenote records for which Lindstrom had no distant viewing NPM data.[70] For 10,049,730 of these 11,299,321 records (=88.9%), Dr. Gray assumes that the programming had zero distant viewing even though there is no information from Nielsen regarding distant viewing for these records.[71] For many of these records, there is no basis to assume that there was even one NPM household among the distant subscribers for these stations. In this case, a missing Lindstrom NPM distant records simply indicates that there were no NPM households in the sample and it provides no information regarding actual distant viewing. Simply assuming that the distant viewing should be coded as zero is wrong and will create a biased estimate.

55.   For the other 10.3 percent (=1,249,591/12,081,142) of the records for which Lindstrom had no NPM data, Dr. Gray treats this lack of information on distant viewing as missing distant viewing. He does not use these data in his regression analyses.[72] Thus, most of the instances for which Lindstrom had no NPM data get coded as zero distant viewing by Dr. Gray.

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[69] In the 2010-13 Cable proceeding, Dr. Gray used a different rule where he also considered the Lindstrom local viewing records when determining which Gracenote records to code as zero and which to leave as missing. In his current construction of the analysis datasets used in his Table 4 models, Dr. Gray does not consider local viewing.

[70] See electronic file "006_gray_data_build.log". 11,299,321 = 12,081,142 – 781,821.

[71] Within the group of 10,049,730 records with no distant viewing data but for which Dr. Gray assumes zero distant viewing, 43.5 percent (4,373,122) of the records have local viewing data but Dr. Gray makes no use of the local data in his Table 4 analysis. 56.5 percent (5,676,608) of the data have no records whatsoever in the Lindstrom data – the records only appear in the Gracenote data. See electronic file "006_gray_data_build.log".

[72] These records are not used to estimate the Gray regression analysis for Table 4, Model 1 but Dr. Gray uses the regression model to predict distant viewing for these records and these predictions are used in his Table 4, Model 1 distant viewing share estimates. See electronic file "006_gray_data_build.log".

Table 3: Dr. Gray's 12.1 Million Record Analysis Dataset
(after excluding 11.8 percent of the NPM data)[73]

	Gracenote Records	NPM Distant Viewing Records
Used in Gray regression analyses.	781,821	781,821
Used in Gray regression analyses.	10,049,730	
Excluded from Gray regression analyses. Gray uses regression to predict distant viewing for these records.	1,249,591	
Records used in Gray Regression Analyses	10,831,551	781,821
Records included in Table 4, Model 1 Estimates	12,081,142	781,821

56.   Consider the example of KMSP-DT in 2011. Dr. Gray includes 37,700 records for KMSP-DT (2011) in his regression analysis but he only has one record with distant viewing from the Lindstrom data — Dr. Gray assumes the proper value of distant viewing is zero for 37,699 records.[74] Moreover, Dr. Gray includes 13 stations in his analysis, a total of 328,675 records, where there is only a single record with distant viewing (i.e., 13 records [0.004%] with any Lindstrom distant viewing out of 328,675 records).[75] See Appendix H for a listing of the number of non-missing records in the Gray analysis.

57.   On average, each station has about 30,500 records (one record for each quarter hour in the year). There are, for example, 130 stations 2010-2013 that have 20 or fewer Lindstrom NPM records for the whole year (649 Lindstrom distant viewing records in total for these 130 stations). These stations contribute 2,185,995 records to Dr. Gray's regression analysis, and (2,185,995-649=) 2,185,346 of the records have zero distant viewing. For these 2,185,346 records there is no distant viewing data from Mr. Lindstrom, and Dr. Gray assumes the proper distant viewing is zero.[76]

58.   For 10.3 percent (=1,249,591/12,081,142 see Table 3) of the total Gracenote

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[73] See electronic file "006_gray_data_build.log".
[74] See electronic file "007_record_count.log".
[75] See electronic file "007_record_count.log".
[76] See electronic file "007_record_count.log" for all the claims in this paragraph.

records, Dr. Gray does assume that the distant viewing is unknown and these records are excluded from entering into his regression analyses. Dr. Gray does, however, use his regression analyses to predict the distant viewing for these records. For example, Dr. Gray excludes all of the 37,823 records from WMUR-DT (2012) from his regression analysis because there are no Lindstrom data records for this station with positive distant viewing.[77] Dr. Gray, however, predicts distant viewing (using his regression analysis) for WMUR-DT and includes all 37,823 Gray predicted distant viewing estimates in his Table 4 analysis. Dr. Gray decided to exclude all the 37,823 records from his regression analysis because there was not a single record with any distant viewing in the Lindstrom data. If, hypothetically, there had been a single Lindstrom distant viewing record for WMUR then, according to the Gray rules, he would have included all these records in his regression analysis and assumed that the proper distant viewing was zero for the other 37,822 records.

H. Gray's Purported 'Premium' Calculation is Simply A Measure of Viewership

59.   In the 2010-13 Cable Final Determination, the Judges held that viewership is not an appropriate measure of value because "viewership, without more, is an inadequate measure of relative value of the different categories of programming."[78] Dr. Gray contends that he has accounted for this premium. Dr. Gray is wrong. The "premium" proffered by Dr. Gray is simply a comparison of a program category's share of viewing to its share of distant subscribers. In other words, it is nothing more than a viewing estimate. It offers nothing to account for the difference in value that an MVPD places on certain types of programming relative to others.

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[77] See electronic file "007_record_count.log".
[78] Distribution of Cable Royalty Funds, 84 Fed. Reg. 3552, at 3610 (Feb. 12, 2019) ("2010-13 Cable Final Determination").

60.   As a simple test of Dr. Gray's purported premium, we compared the premium as derived by Dr. Gray as compared to the premium contained in the allocations employed by the Judges in the 2010-13 Cable Final Determination. Table 4 shows Dr. Gray's calculation of the ratio of viewing to volume.

Table 4: Gray's Table 5 Showing "category's valuation premium compared to other categories."[79]

Table 5: Summary of Volume Shares and Compensable Distant Viewing Shares, 2010-2013

Year	Claimant Category	Weighted Compensable Hours Shares	Model 1 Viewing Shares of Compensable Programming	Premium Ratio: Viewing to Volume
Average: 2010 through 2013	Commercial Television	26.56%	17.99%	0.68
	Devotionals	1.46%	0.43%	0.29
	Program Suppliers	62.46%	69.43%	1.11
	JSC	9.52%	12.15%	1.28
	Total	100%	100%	1.00

61.   Dr. Gray explains that his premium is estimated by comparing the viewing-to-volume ratio of one claimant category to another.[80] For example, Dr. Gray estimates that the premium of JSC to PS is 1.15 (=[1.28 for JSC]/[1.11 for PS]) – a 15 percent (=1.15-1) premium for JSC. For comparison, the Judges in the 2010-13 Cable Final Determination, calculated a premium of JSC to PS equal to 8.28 on average for 2010-2013 – 728 percent (=8.28-1) premium for JSC. The Judges, therefore calculated a premium for JSC relative to PS of 47.5 (=728%/15%) times larger than Dr. Gray (see Appendix N). Similarly, Dr. Gray estimates that PS had a premium larger than Commercial Television and Devotionals while the Judges determined the opposite.

62.   Likewise, I understand that the premium MVPDs actually pay for JSC content (as measured by the difference between affiliate fees and ratings) is far greater than

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[79] Gray Testimony ¶ 71, Table 5. Red annotation added.
[80] Gray Testimony ¶ 38.

estimated by Dr. Gray.[81]

V. DR. GRAY'S VIEWING STUDY ESTIMATES ARE NOT PLAUSIBLE AND DEMONSTRATE HIS METHODOLOGY IS NOT VALID

63.   In statistics, the concept of "validity" refers to the extent to which a statistical method that purports to accurately measure an aspect of the real world actually does so. This very basic idea has a long history in the theory and practice of statistics, where comparisons of "predicted" versus "actual" results are routinely used to assess the quality of a statistical method.[82,83] A validity test of whether or not Dr. Gray's methodology accurately measures what it claims to measure can be performed by comparing Dr. Gray's viewing estimates to known benchmarks. Such comparisons of the results of the Gray methodology to the known benchmarks will reveal whether or not the methodology actually performs as claimed. Dr. Gray performed no such comparisons.

64.   The results of this comparison demonstrate that Dr. Gray's "viewing" analysis does not provide a valid estimate of viewing on distant signals. As another evaluation of the reliability and face validity of the Gray estimates, we compare various Gray distant viewing estimates to one another — this evaluation also shows the Gray estimates are not reliable and lack face validity.

A. The Gray Model's Allocation of Royalties to WGN is Much Lower Than the Actual Royalties Paid to Retransmit WGN

65.   WGN was the most distantly retransmitted broadcast signal during 2010-2013. Table 5 shows that WGN accounted for 73.5 percent ($267,199,758) of all royalties

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[81] Written Rebuttal Testimony of James M. Trautman, Docket No. 14-CRB-0011-SD (2010-13) (Aug. 26, 2019, at 3-12).

[82] Kotz, Samuel; Johnson, Norman L. "Validity," *Encyclopedia of Statistical Sciences*, Volume 9, 1988.

[83] Essential Statistics, Regression, and Economics, Gary Smith.

paid by satellite carriers pursuant to Section 119 during this period. Dr. Gray, however, only allocates 13.1 percent ($47,577,481) of the overall royalties paid to retransmit WGN to programming on WGN. Dr. Gray allocates the remaining $219,622,277 of the $267,199,758 in royalties to programming on other stations. See Table 5 and Figure 8.[84]

Table 5: WGN Actual Royalties and Gray's Royalty Allocation to WGN
Gray Allocates to WGN $0.18 for Every $1 in Actual WGN Royalties

	Actual WGN Royalties [1]	WGN Share of Total Royalties [2]	Gray's Allocated WGN Royalties [3]	Gray's Allocated WGN Share of Total Royalties [4]	Dollars Allocated to WGN by Dr. Gray per Actual Royalties Paid to Broadcast WGN [5] = [3] / [1]
2010	$66,048,228	69.0%	$12,162,319	12.7%	$0.18
2011	$66,059,442	70.3%	$13,993,171	14.9%	$0.21
2012	$68,041,818	77.3%	$11,353,565	12.9%	$0.17
2013	$67,050,270	78.1%	$10,068,426	11.7%	$0.15
2010-2013	$267,199,758	73.5%	$47,577,481	13.1%	$0.18

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[84] See electronic file "048_table5.log" for both Table 5 and Figure 8.

Figure 8: WGN Actual Royalties and Gray's Royalty Allocation to WGN
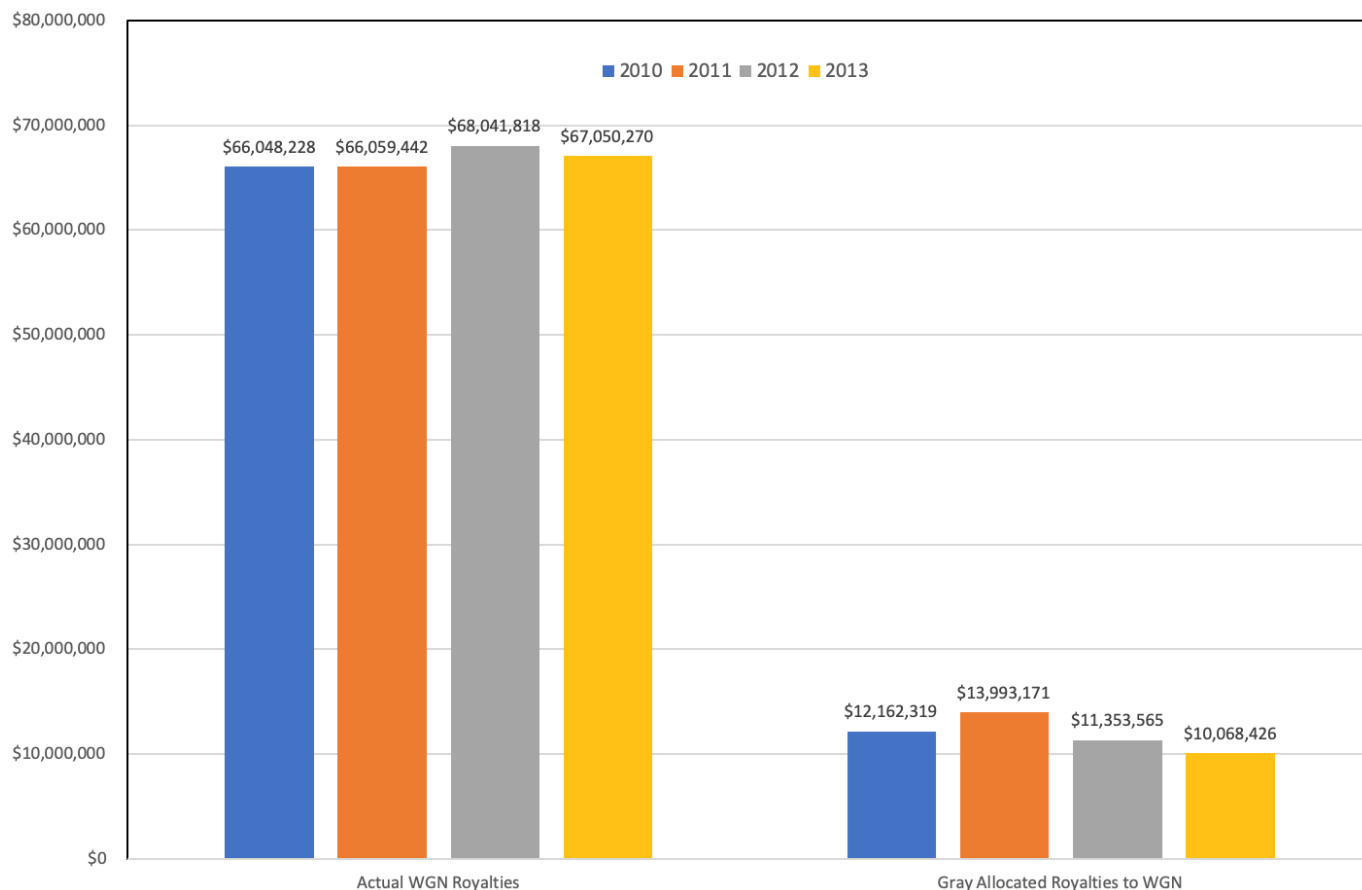
66.   Dr. Gray's allocation with regard to WGN is illogical given what is known about the satellite carriers' payments to distantly retransmit the signal. If Dr. Gray had allocated royalties to WGN equal to those paid by satellite carriers to distantly retransmit WGN, then JSC's share (accepting, for purposes of this exercise only, the other elements of Dr. Gray's analysis) for programming on WGN would have increased by $89.7 million.[85] This is just one illustration of the substantial biases against JSC in Dr. Gray's analysis.

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[85] See electronic file "066_calculation.log".

B. Gray Model's Allocation of Royalties to Program Suppliers Programming on Non-WGN Stations is Always Larger Than the Actual Royalties Paid to Rebroadcast Non-WGN Stations

67.   Just as Dr. Gray understates royalties for JSC, he overstates royalties for Program Suppliers. There are 395 station-years in the Gray analysis. Excluding WGN, there are 391.[86] Dr. Gray's enhanced viewing methodology allocates more royalties to *Program Suppliers alone* for each of these 391 station-years than satellite carriers actually paid to carry the stations.

68.   For example, in 2010 satellite carriers paid $206,176 in royalties to distantly retransmit KTFF. The Gray methodology allocates $2,086,750 (=$2,292,926-$206,176) to Program Suppliers for programs broadcast on KTFF. That is more than ten times greater than total amount satellite carriers paid to retransmit the signal.[87]

69.   Appendix F compares the dollars Gray allocates to Program Suppliers programming on non-WGN stations to the royalties actually paid to carry these stations in the 2010-13 period. Figure 9 (a graphical representation of the data in Appendix F) shows that Dr. Gray allocates more royalties to Program Suppliers programming on every non-WGN station than was paid in royalties to retransmit them.

70.   The over-allocation problem is most pronounced for smaller non-WGN stations, and decreases as the stations get larger. For WPIX in 2010 — the mostly widely retransmitted non-WGN signal in that year — Gray allocates $6,716,400 in royalties to Program Suppliers content on the signal. Satellite carriers only paid $5,112,418 in royalties to retransmit WPIX in 2010.[88]

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[86] See electronic file "064_table.log".
[87] See electronic file "067_app_f.log".
[88] See electronic file "067_app_f.log".

Figure 9: Royalty Dollar Allocated to Program Supplier by Dr. Gray per
Actual Total Royalty Dollar for all Non-WGN stations 2010-2013
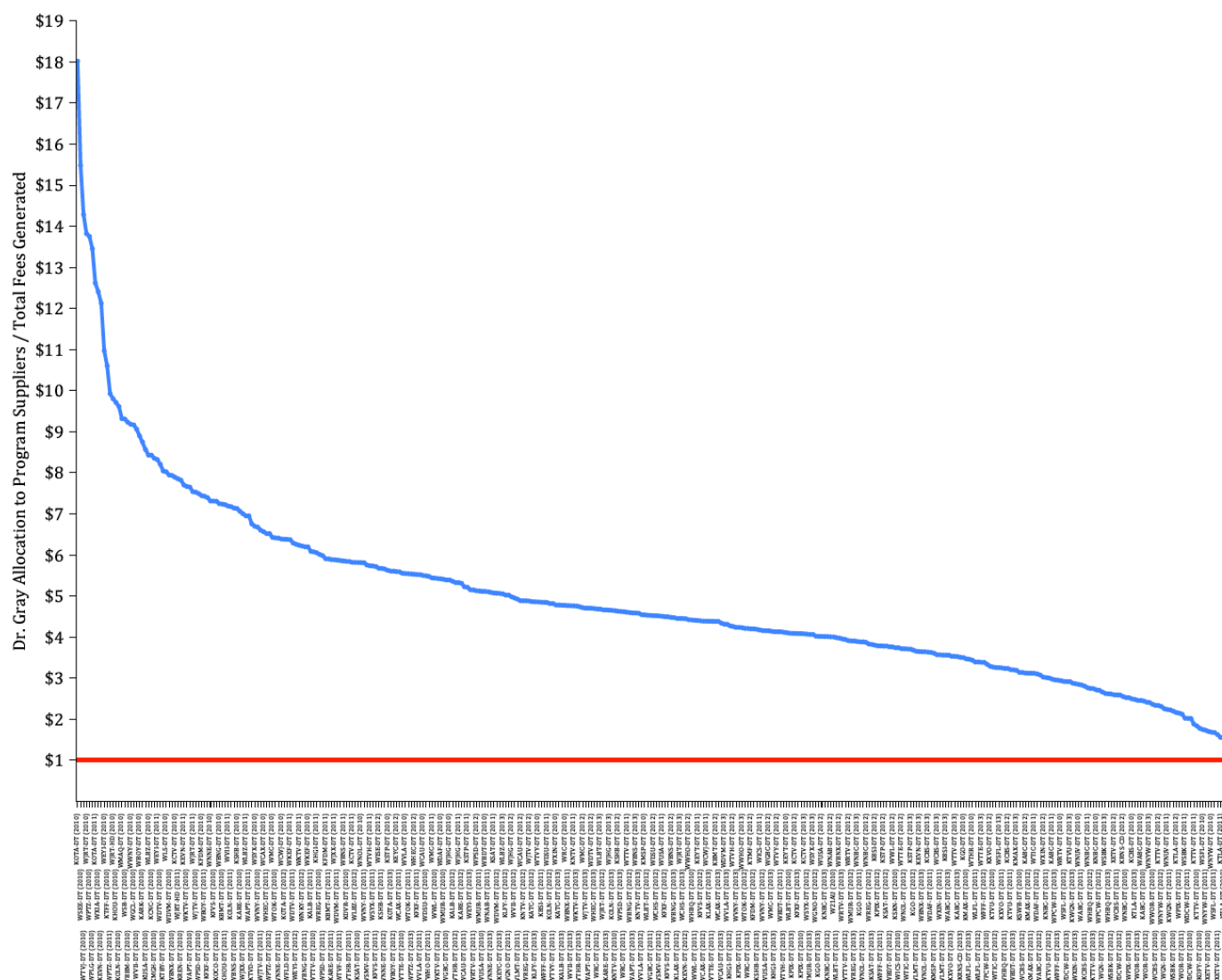
71.   Dr. Gray also vastly over-allocates royalties to network signals (as "network" is defined under Section 119). Table 6 shows that network signals account for 16.7 percent ($60,584,156) of all royalties 2010-2013. Dr. Gray, however, allocates 381% percent ($230,600,812 or $3.81 in allocated royalties per actual royalty dollar) of the overall royalties paid to retransmit network programming to programming on network signals.

Table 6: Network Signals' Actual Royalties and
Gray's Royalty Allocation to Network Signals[89]

	Actual Network Signals Royalties [1]	Network Signals Share of Total Royalties [2]	Gray's Allocated Network Signals Royalties [3]	Gray's Allocated Network Signals Share of Total Royalties [4]	Dollars Allocated to Network Signals per Actual Royalties Paid to Broadcast Network Signals [5] = [3] / [1]
2010	$20,319,644	21.2%	$65,006,738	67.9%	$3.20
2011	$14,157,440	15.1%	$52,369,992	55.7%	$3.70
2012	$13,206,489	15.0%	$56,209,865	63.9%	$4.26
2013	$12,900,582	15.0%	$56,213,639	65.5%	$4.36
2010-2013	$60,584,156	16.7%	$230,600,182	63.4%	$3.81

C. The NBA Finals, Game 7 (Boston Celtics at Los Angeles Lakers, June 17, 2010, 9pm) Case Study

72.   In 2010, there were 18 distantly retransmitted stations that distantly broadcasted Game 7 of the NBA Finals —played between the Boston Celtics and the Los Angeles Lakers in Los Angeles. These 18 stations provide a natural experiment to test the Gray "enhanced" distant viewing predictions and to gain a practical understanding of how the Gray model makes predictions of distant viewing.[90]

73.   Figure 10 shows the Gray distant viewing predictions (as a percent of distant subscribers) for the 18 stations that broadcast Game 7 at 9pm sorted from the smallest station on the left (KOTA with 79 total distant subscribers) to the largest station on the right (WABC with 516,544 distant subscribers).

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[89] *See* electronic file "068_table6.log".
[90] *See* electronic file "240_nba_finals.log".

Figure 10: Dr. Gray's Distant Viewing Estimates per Distant Subscriber
NBA Finals, Game 7, Boston Celtics at Los Angeles Lakers, June 17, 2010, 9pm[91]
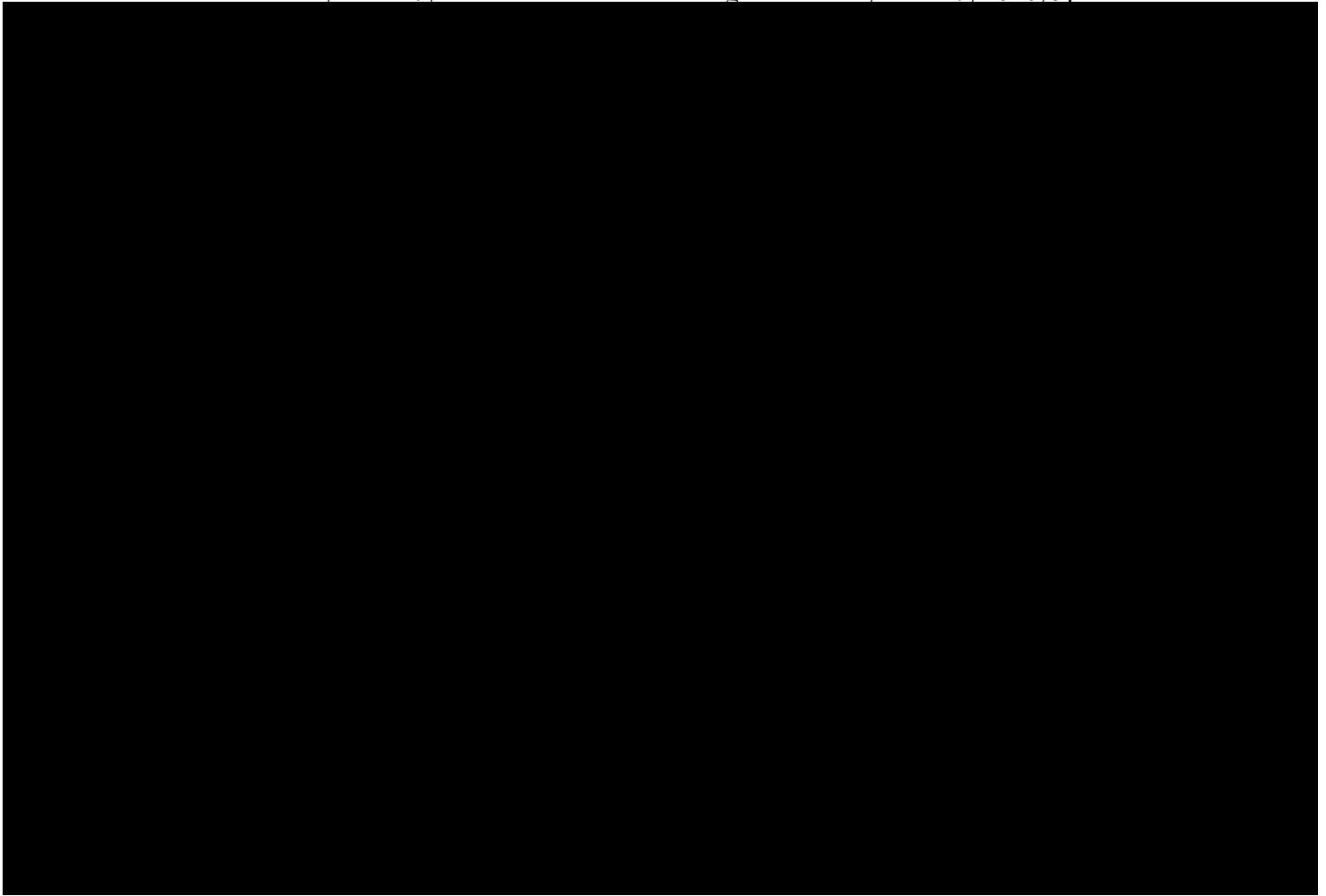
74.   The Gray "enhanced" viewing methodology only uses three variables to make distant viewing estimates for all programs in the Gray data: (1) number of distant subscribers for the station, (2) the program type, and (3) the time of day. For this NBA Final Game 7, the program type (i.e., playoff sports) and time of day (i.e., 9pm) are

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[91] See electronic file "240_nba_finals.log".

identical for every station's estimate, therefore, the only thing that distinguishes the Gray estimates across 18 stations is the number of distant subscribers.[92]

75.   The Gray estimate of distant viewing for KOTA (a station in Rapid City with only 79 distant subscribers) had ▮ times (=▮▮▮▮) the viewership of KABC (a station in Los Angeles with 381,863 distant subscribers).[93] The Gray model will always predict more viewing for smaller stations (all other things equal). For example, suppose we compare two stations, one station has 100 distant subscribers and another station has 100,000 distant subscribers (i.e., there is a 1,000-fold increase in distant subscribers). Assuming everything else is the same between these two stations (i.e., same programs broadcast at the same times) then it might be reasonable to expect that the change in distant viewing between the small and large station would increase by about 1,000 times. The Gray Model, however, will never predict this. In this situation the Gray model[94] estimates there will only be a 182-fold increase (not a 1,000-fold increase) in distant viewers.

76.   As another test of Dr. Gray's regression, we re-estimated the number of distant viewers for KABC watching the Celtics-Lakers game using the Gray model, but instead of a single prediction (based on 381,863 distant subscribers) we performed separate predictions for smaller groups of distant subscribers and then added all the individual predictions together. Logically, if the Gray model were reliable it should get the same

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[92] The fact that the only variable that changes in the Gray estimates in Figure 10 is distant subscribers is also shown in the formula Gray uses to estimate the distant viewing for this NBA Finals Game 7 at 9pm:

$$Gray\ estimated\ distant\ subscribers = f(distant\ subscribers)$$
$$= e^{[0.7227 + 0.75 * \ln(distant\ subscribers)]}$$

The Poisson regression coefficients are -2.84152 (constant), 2.680955 (Playoff sports), 0.8832863 (quarter hour=85, 9pm), 0.753644 (distant subscribers). $0.7227 = -2.84152 + 2.680955 + 0.8832863$.

[93] See electronic file "240_nba_finals.log".

[94] *See* Gray Model 1 for non-WGN in 2010.

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estimates of distant subscribers regardless of the grouping on the number of distant subscribers. Table 7 shows that the Gray model gets very different estimates of distant viewing where the total number of distant subscribers remains the same, but is split into smaller groups[95].

Table 7: Ratio of Gray model distant viewing divided by distant subscribers for KABC where prediction is done of separate groups for KABC Distant Subscribers

Groups of Distant Subscribers	Number of Subscribers within Group	KABC Total Distant Subscribers	Gray Model Predicted KABC Distant Viewing	Distant Viewing / Distant Subscribers
1	381,863	381,863	33,162	9%
10	38,186	381,863	58,479	15%
100	3,819	381,863	103,123	27%
1,000	382	381,863	181,850	48%
4,834	79	381,863	268,096	70%

D. Dr. Gray's Predictions of Distant Viewing of The Super Bowl are Illogical and Invalid

77.   Nielsen reports on their website that between 45 percent and 47.1 percent (about 46 percent on average) of TV households were viewing the Super Bowl 2010-2013.[96] Nielsen also reports that the Super Bowl is the single most viewed program in the year. If Dr. Gray's distant viewing estimates based on his "enhanced viewing methodology"[97] are to be believed, then his methodology should produce reliable and rational estimates of the number of distant viewers and the percent of distant subscribers that are watching the Super Bowl. We reviewed the Gray model estimates and found that the Gray Super Bowl estimates are unreliable and untrustworthy; they likely understate Super Bowl viewing.

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[95] See electronic file "065_table7.xlsx".
[96] Nielsen, Super Bowl XLVII Draws 108.7 Million Viewers, 26.1 Million Tweets (Feb. 5, 2013).
[97] Gray Testimony ¶58.
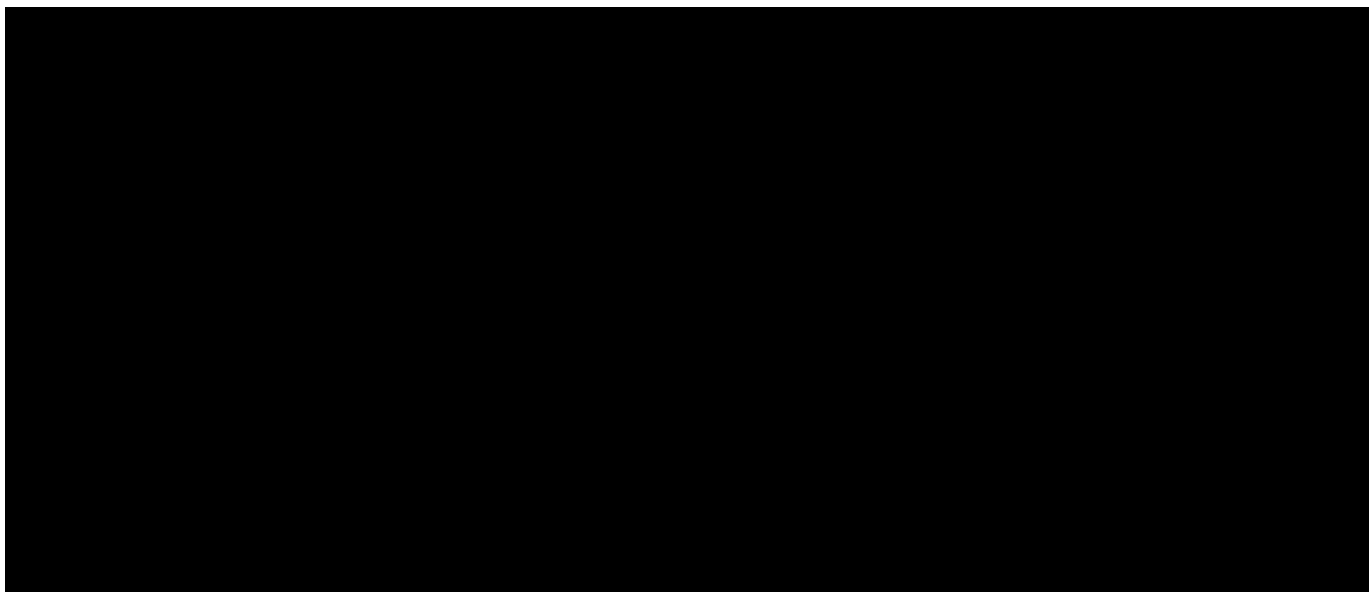
78.   The largest four stations 2010-2013 to distantly broadcast the Super Bowl were all located in New York City (WCBS, WNYW, WNBC, WCBS), and they had 515,254, 520,178, 368,363, 367,903 total distant subscribers, respectively, in February of the Super Bowl year.[98]

79.   The Lindstrom data used estimate that between ███████████ percent of the distant subscribing households were watching the Super Bowl 2010-2013 (see Table 8).[99] This is lower than what Nielsen estimates for viewership of the Super Bowl. Dr. Gray's regression further depresses the already low prediction in the raw Lindstrom data, estimating Super Bowl viewership on these four stations was between 3 percent and 4 percent.

Table 8: Lindstrom Distant Viewing Estimates Compared to Gray "Enhanced Viewing" Estimates for Super Bowl 2010-2013 (New York Stations)[100]

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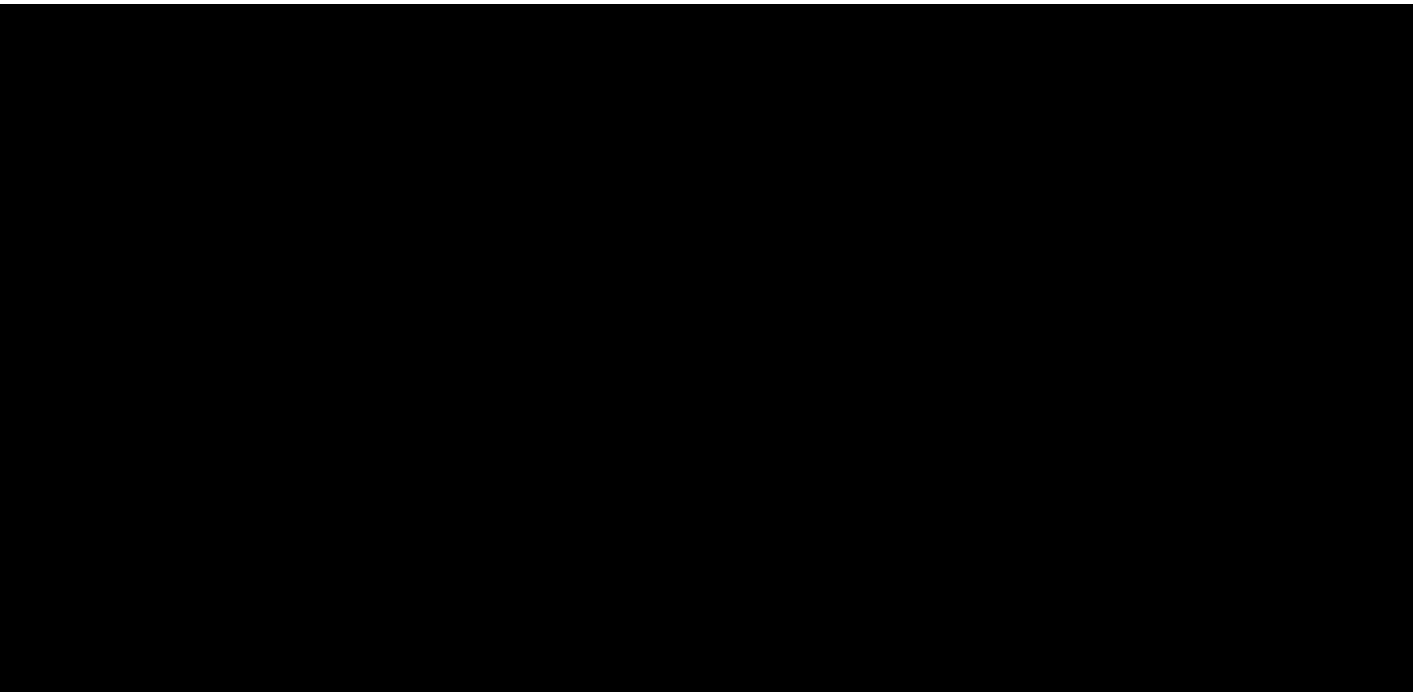
[98] See electronic file "029_super_bowl.log".
[99] See electronic file "029_super_bowl.log".
[100] See electronic file "029_super_bowl.log".
[101] Nielsen, Super Bowl XLVII Draws 108.7 Million Viewers, 26.1 Million Tweets (Feb. 5, 2013).

80.   The second four largest stations 2010-2013 to distantly broadcast the Super Bowl were all located in Los Angeles (KCBS, KTTV, KNBC, KCBS), and they had 389,920, 364,459, 259,859, 235,536 total distant subscribers, respectively, in February of the Super Bowl year.

81.   The Lindstrom data estimate that between ███████████ percent of the distant subscribing households were watching the Super Bowl 2010-2013 (see Table 9).[102] This is much lower than what Nielsen estimates for viewership of the Super Bowl. Dr. Gray's regression further depresses the already low prediction in the raw Lindstrom data, estimating Super Bowl viewership on these four stations was between 3 percent and 4 percent.

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[102] See electronic file "029_super_bowl.log".
[103] Nielsen, Super Bowl XLVII Draws 108.7 Million Viewers, 26.1 Million Tweets (Feb. 5, 2013).

82.   The results are similarly implausible when all Super Bowl records are aggregated together. Overall, 2010-2013, there were 62 different stations, with a total of 3.75 million distant subscribers, that distantly retransmitted the Super Bowl according to the Gray data.[104] Dr. Gray estimates Super Bowl viewership on these 62 stations was 5.9 percent on average during 2010-2013.[105] This is still far lower than the Nielsen viewing estimate (46%). The individual Gray viewing estimates are unreliable, and they are equally unreliable when aggregated.

E. Other Illogical Gray Viewing estimates

83.   We can review the coefficients in the Gray distant viewing regression analyses and directly determine its estimates of the relative distant viewing level among various program types. Dr. Gray estimates that the most viewed program type in 2010 was "Pelicula," *i.e.* Spanish-language movies. Dr. Gray estimates that Pelicula (all other things equal) has 52 percent more viewing than "Playoff Sports," 109 percent more viewing than "Team vs. Team," 773 percent more viewing than Syndicated, 874 percent more viewing than News, and 2,028 percent more viewing than Movies. This bias in Dr. Gray's "Pelicula" estimates can be seen by looking at Dr. Gray's estimated top 200 most viewed programs in 2010 (see Appendix J) — 178 (89%) of the Gray most viewed programs are "Pelicula."

84.   Gray's estimates for "Pelicula" are not credible and are the product of the improper use of NPM data. The Pelicula records were limited to only one station, KTFF. That station simply happened to have a lot of Lindstrom records because it was

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[104] Dr. Gray included all these stations in his distant viewing estimates in Table 4, Model 1.
[105] See electronic file "029_super_bowl.log".

overrepresented in the Lindstrom data. This is why Gray's model estimates that Pelicula is so widely viewed.

85.   Among all the records for KTFF (with 206,176 average distant subscribers in 2010), 53.5 percent of them had a Lindstrom NPM distant viewing value. This proportion of non-missing records is much larger than stations with a similar number of average distant subscribers in 2010. This further demonstrates that the Lindstrom data is not based on a valid random sample across all stations.

Table 10: Percent of Records with Non-missing Lindstrom Distant Viewing
Stations with Between 100,000 and 300,000 Distant Subscribers in 2010

Station	Average Subscribers	Records with Non-missing Lindstrom Distant Viewing
KTFF-DT	206,176	53.490%
KOFY-DT	287,256	0.351%
WWOR-DT	212,705	9.727%
KWGN-DT	202,449	3.638%
WSBK-DT	198,243	8.459%
W21AU	163,477	0.000%
WTHR-DT	157,574	0.019%
WRTV-DT	157,574	0.008%
KGO-DT	105,962	8.845%

86.   As another test of the program categories in the Gray data and regression analysis, we reviewed the regression estimates for the program type "Mini-Series". Dr. Gray's "enhanced" model estimates that the 2nd most viewed Gracenote program type (all other things equal) in 2010 was "Mini-Series," but also estimates that it was the *least* relatively viewed program type in 2011. [106]

87.   The Gray "enhanced" model for 2010 estimates that for a hypothetical station with 1,500,000 distant subscribers, there will be 135,749 distant viewing

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[106] The Gray Table 1, Model 1 regression for non-WGN in 2011 reports a coefficient for Mini-Series = -20.31795.

households for "Mini-Series".[107] In 2011, the Gray "enhanced" model estimates that for a station with 1,500,000 distant subscribers there will be *zero* distant viewing households (not a single distant viewer) for "Mini-Series."[108] The Gray "enhanced" model estimates that distant viewing of "Mini-Series" in 2010 is more than 14 billion times larger than "Mini-Series" in 2011. This large variation in the results year over year demonstrates that Gray's model is not reliable.

VI. DR. GRAY'S VOLUME ESTIMATES OF RELATIVE MARKET VALUE ARE UNRELIABLE

88. Dr. Gray presents several measures of volume, which he argues are "a rough measure of the relative market value" of a category of programming."[109] Dr. Gray presented a similar volume study in the 2010-13 cable royalty distribution proceeding, which he conceded was not "sufficient" to measure the relative value of programming; the Judges did not rely upon it.[110] None of Dr. Gray's volume measurements consider any metrics beyond volume of carriage, and therefore do not provide a reliable measure of relative market value.[111] Gray Tables 1 and 2 have the additional problem that they ignore the number of distant subscribers that actually received the retransmissions. Dr. Gray, in his Table 1 and 2, treats all program broadcast minutes the same across all stations — a minute of programming on WGN, which reached 22 million distant subscribers, is treated the same as station that reached only a few hundred subscribers

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[107] Gray non-WGN 2010 regression estimates for quarter hour 95 (i.e., 9pm).
[108] Gray non-WGN 2011 regression estimates for quarter hour 95 (i.e., 9pm).
[109] Gray Testimony ¶ 49.
[110] 2010-13 Cable Final Determination at 3592, n.148.
[111] Written Rebuttal Testimony of Andrew R. Dick, Ph.D., Docket No. 14-CRB-0011-SD (2010-13) (Aug. 26, 2019) at ¶¶ 55-57.

VII. DR. GRAY'S FEES-BASED REGRESSION METHODOLOGY IS NOT RELIABLE TO ESTIMATE RELATIVE MARKET VALUE

89.   Dr. Gray, in his Table 7 and 8, reports his estimates of his fees-based regression and the "relative share of the royalty pool" allocated based on that regression. Dr. Gray reports these results but he does not opine that these results should be adopted as a measure of relative market value.

90.   Dr. Gray also opines that "satellite carriers face materially different compulsory license schemes" and, therefore, the Gray fees-based regression in this case will necessarily be different from the fees-based regression in cable proceedings.[112]

91.   We have reviewed the Gray fees-based regression and we conclude that the Gray regression and the Gray average marginal value and implied royalties (which are based on the regression) are unreliable.

92.   Table 11 shows the Gray share estimates and coefficients from his fees-based regression (Gray Table 8).

Table 11: Dr. Gray Share Estimates and Coefficients from his
Fees-based Regression (Gray Table 8)

Claimant Category	Gray's Royalty Share Fees-based Regression		Regression Coefficients[113]	
	Using 6-month Accounting Periods	Using Monthly Data	Using 6-month Accounting Periods	Using Monthly Data
Commercial Television	14.41%	0.00%	0.955	-1.93
Devotionals	3.25%	6.35%	3.43	1.98
Program Suppliers	82.34%	92.25%	1.18	0.39
JSC	0.00%	1.40%	-0.585	0.176

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[112] Gray Testimony ¶¶ 82-92.
[113] Regression coefficients multiplied by 10^6.

93.   None of the regression coefficients, or the implied share estimates, for the claimant categories are statistically significantly different from zero at the 95 percent confidence level. Dr. Gray uses the 95% confidence level when evaluating the statistical significance in his "enhanced" model (i.e., Table 4) regressions analysis.[114] If Dr. Gray would have used a 95% confidence level then he would have no scientifically reliable basis to estimate any of the average marginal values and implied royalties (Gray Table 8) for either model because none of the claimant category coefficients are statistically significantly different from zero.

94.   When evaluating the statistical significance of this fees-based regression, Dr. Gray switched to a less strict 90 percent confidence level. Using this 90 percent confidence level, Dr. Gray concludes that none of the estimates for the claimant categories (in the 6-month accounting period model) are statistically significantly different from zero statistically. Given Dr. Gray's conclusions regarding statistical significance, he has no scientifically reliable basis to estimate any of the average marginal values and implied royalties (Gray Table 8) for the 6-month accounting period model because none of the claimant category coefficients are statistically significantly different from zero.

95.   Switching to the Gray fees-based regression based on monthly data, he concludes that the coefficient for program suppliers is significantly different from zero (at the 90% confidence level) in the fees-based regression using monthly data (Table F-2). He also reports that none of the other coefficients for Commercial Television, Devotionals or JSC are statistically significantly different from zero. Given Dr. Gray conclusions regarding statistical significance, he has no scientifically reliable basis to estimate average marginal value and implied royalties for commercial suppliers, devotionals or JSC using

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[114] See Gray Appendix G and the "APPENDIX D: ENHANCED VIEWING REGRESSION MODELS" where all the confidence intervals are reported at the 95% level.

his model with monthly data because these three claimant category coefficients are not statistically significantly different from zero. The various other studies presented in this case, as well as the testimony of industry data, confirm that the results produced by Gray's fee-based regression are invalid.

VIII.   CONCLUSION

96.   For all of the reasons set forth above, none of the methodologies presented by Dr. Gray provide a valid and reliable measure of the relative marketplace value of the Agreed Categories of programming.[115]

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[115] In Table 7 of our written direct testimony, we applied the Judges' decision in the 2010-13 Cable Final Determination as a benchmark for distributing the 2010-13 satellite royalty funds. At the request of JSC, we provide in Appendix P a recalculation of that benchmark analysis that applies the 2010-13 Bortz survey results as the benchmark rather than the 2010-13 Cable Final Determination.

I declare under penalty of perjury that the foregoing is true and correct.

_____   August 26, 2019
William E. Wecker, Ph.D.   Date

I declare under penalty of perjury that the foregoing is true and correct.

_____   August 26, 2019
R. Garrison Harvey   Date

Appendix A: CV. of Dr. William E. Wecker

January 2019

WILLIAM E. WECKER

270 E Simpson Ave
PO Box 1010
Jackson WY 83001-1010

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E-Mail: wecker@wecker.com

EDUCATION

B.S.   Basic Science, U.S. Air Force Academy (1963)
M.S.   Operations Research, University of Michigan (1970)
Ph.D.   Statistics and Management Science, University of Michigan (1972)

EMPLOYMENT

1963-1967   Fighter pilot, U.S. Air Force
1968-1969   Chief of Protocol, U.S. Air Force, Berlin, Germany
1970-1972   Graduate Student, University of Michigan
1973-1976   Assistant Professor, Graduate School of Business, University of Chicago
1977-1983   Associate Professor, Graduate School of Business, University of Chicago
1984-1985   Associate Professor, Graduate School of Management, University of California, Davis
1985-1989   Professor, Graduate School of Management, University of California, Davis
1994-1998   Consulting Professor of Law, School of Law, Stanford University
1990-   President, William E. Wecker Associates, Inc.

ACTIVITIES

1977-1981   Associate Editor (Theory and Methods), Journal of the American Statistical
             Association

1981-1999   Associate Editor, Journal of Business and Economic Statistics

1990-1992   Management Committee, Journal of Business and Economic Statistics

1976-1994   Seminar Leader, NSF/NBER Seminar on Time Series Analysis

1993-1994   National Advisory Council on Environmental Policy and Technology
             (Lead Subcommittee)

Member of: American Association for the Advancement of Science
             American Statistical Association
             Institute of Mathematical Statistics
             Society for Risk Analysis

PUBLICATIONS

"A Nonparametric Approach to the Construction of Prediction Intervals for Time Series Forecasts" (with W. A. Spivey), <u>Proceedings of the Business and Economic Statistics Section--American Statistical Association</u>, 1972.

"Regional Economic Forecasting: Concepts and Methodology" (with W. A. Spivey), <u>The Regional Science Association Papers</u>, Vol. 28, 1972, pp. 257-276.

"On the Weighted Average Cost of Capital" (with R. R. Reilly), <u>Journal of Financial and Quantitative Analysis</u>, January 1973, Vol. VIII, pp. 123-126.

"On Random Walks with Absorbing Barriers" (with Thomas E. Morton), <u>Proceedings of the Business and Economic Statistics Section-- American Statistical Association</u>, 1973.

"Prediction Methods for Censored Time Series," <u>Proceedings of the Business and Economic Statistics Section--American Statistical Association</u>, 1974.

"More on the Weighted Average Cost of Capital: Reply" (with R. R. Reilly), <u>Journal of Financial and Quantitative Analysis</u>, June 1975.

"Predicting Mail Order Demand for Style Goods," <u>Proceedings of the Business and Economic Statistics Section--American Statistical Association</u>, 1975.

"The Prediction of Turning Points," <u>Proceedings of the Business and Economic Statistics Section--American Statistical Association</u>, 1976.

"Bounds on Absorption Probabilities for the m-Dimensional Random Walk" (with T. Morton), <u>Journal of the American Statistical Association</u>, March 1977.

"Discounting, Ergodicity and Convergence of Markov Decision Processes" (with T. Morton), <u>Management Science</u>, April 1977.

"Comments on 'Forecasting with Econometric Methods: Folklore versus Fact'," <u>Journal of Business</u>, 1978, pp. 585-586.

"Comment on 'Seasonal Adjustment When Both Deterministic and Stochastic Seasonality Are Present'," <u>Proceedings of the NBER-CENSUS Conference on "Seasonal Analysis of Economic Time Series</u>," U.S. Government Printing Office, Washington, D.C., 1978, pp. 274-280.

"Predicting Demand from Sales Data in the Presence of Stockouts," <u>Management Science</u>, 1978, Vol. 34, No. 10, pp. 1043-1054.

"The Time Series Which Is the Product of Two Stationary Time Series," <u>Stochastic Processes and Their Application</u>, 1978, pp. 153-157.

"Predicting the Turning Points of a Time Series," <u>Journal of Business</u>, January 1979, Vol. 52, pp. 35-50.

"A New Approach to Seasonal Adjustment," Proceedings of the Business and Economic Statistics Section--American Statistical Association, 1979.

"Linear and Nonlinear Regression Viewed as a Signal Extraction Problem" (with C. Ansley), Proceedings of the Business and Economic Statistics Section-- American Statistical Association, 1980.

"Asymmetric Time Series," Journal of the American Statistical Association, March 1981.

"Predicting a Multitude of Time Series" (with R. A. Thisted), Journal of the American Statistical Association, September 1981.

"Applications of the Signal Extraction Approach to Regression" (with C. Ansley), Proceedings of the Business and Economic Statistics Section--American Statistical Association, 1981.

"Nonparametric Multiple Regression by Projection Iteration" (with C. Ansley), Proceedings of the Business and Economic Statistics Section--American Statistical Association, 1982.

"The Signal Extraction Approach to Nonlinear Regression and Spline Smoothing" (with C. Ansley), Journal of the American Statistical Association, March 1983.

"Extensions and Examples of the Signal Extraction Approach to Regression" (with C. Ansley), Applied Time Series Analysis of Economic Data, A. Zellner (ed.), Washington, D.C.: Bureau of the Census/ASA, 1983.

"The Signal Extraction Approach to Estimating Income and Price Elasticities: A Data Example" (with C. Ansley), Proceedings of the Business and Economic Statistics Section--American Statistical Association, 1983.

"A Nonparametric Bayesian Approach to the Calibration Problem," (with C. Ansley), Proceedings of the Business and Economic Statistics Section--American Statistical Association, 1984.

"On Dips in the Spectrum of a Seasonally Adjusted Time Series" (with C. Ansley), Journal of Business and Economic Statistics, October 1984.

"Estimating Damages in a Class Action Litigation" (with E. George), Journal of Business and Economic Statistics, April 1985.

"Making Statistics More Effective in Schools of Business: Interdisciplinary Cooperation" (with R. Hamada, J. Patell, R. Staelin), Proceedings of the Business and Economic Statistics Section--American Statistical Association, 1986.

"The Role of Statistics in Accounting, Marketing, Finance and Production" (with R. Hamada, J. Patell, R. Staelin), Journal of Business and Economic Statistics, 1988.

"Assessing the Accuracy of Time Series Model Forecasts of Count Observations," Journal of Business and Economic Statistics, October 1989.

"Impact of the Soviet Grain Embargo; A Comparison of Methods" (with A. Webb, et al), <u>Journal of Policy Modeling</u>, pp. 361-389, 1989.

"Modeling Daily Milk Yield in Holstein Cows Using Time Series Analysis" (with H. Deluyker, et al.), <u>Journal of Dairy Science</u>, pp. 539 - 548, 1990.

"Controlling Emissions from Motor Vehicles: A Benefit-Cost Analysis of Vehicle Emission Control Alternatives" (with L. Lave, et al.), <u>Environmental Science & Technology</u>, August 1990.

"Statistical Estimation of Incremental Cost from Accounting Data" (with R. Weil), <u>Handbook of Litigation Services for Accountants and Lawyers</u>, John Wiley & Sons, 1990.

"Correcting for Omitted-Variables and Measurement-Error Bias in Regression with an Application to the Effect of Lead on IQ" (with M. L. Marais), <u>Journal of the American Statistical Association</u>, June 1998.

Appendix B: CV. of Robert Garrison Harvey

R. GARRISON HARVEY   August 2019

William E. Wecker Associates, Inc.
270 E. Simpson Avenue
Jackson, WY 83001-1010

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E-Mail: Harvey@Wecker.com

Gary Harvey is Vice President and Principal Consultant at William E. Wecker Associates, Inc. based in Jackson Hole, WY. He received the Bachelor of Science degree in Applied Mathematics from the United States Air Force Academy and the Master of Science degree in Operations Research from the Air Force Institute of Technology. Prior to joining William E. Wecker Associates, Inc. he was an officer in the U.S. Air Force analyzing U.S. force structure and weapon systems performance.

He has served as an expert witness in litigation, arbitration, and regulatory proceedings involving evaluation of damages, breach of contract, copyright infringement, consumer product performance, epidemiology, sample design, payment card market analysis and profitability, statistical analysis of payment card industry data, and class certification.

Additionally, he has worked as a consultant on numerous litigation and business consulting engagements including: antitrust matters involving claims of price-fixing; matters involving claims of false advertising, unfair competition and monopolization, consumer product safety and performance, and environmental damage; class actions alleging disparate impact in insurance, insurance claims, lending, and wages; and patent and intellectual property matters involving pharmaceutical drugs, petrochemical formulation, and automobile components.

Mr. Harvey has expertise in statistical and mathematical analysis of data. This expertise includes damage analysis; survey design, analysis and administration; U.S. and international payment card market analysis, profitability and forecasting; human health and epidemiology involving tobacco risks, dynamic propagation of viruses, pharmaceutical drugs, and consumer products; automobile safety and valuation; hospital data analysis; class certification; evaluation of insurance claims including allocation among primary and excess insurance carriers; regression analysis; survival analysis; Bayesian analysis including imputation of missing data, propensity score analysis, conjoint analysis, forecasting, and big data analysis.

EDUCATION

B.S.   (Applied Mathematics) (1988), USAF Academy
M.S.   (Operations Research) (1992), Air Force Institute of Technology

PROFESSIONAL EXPERIENCE

1988 - 1990	Scientific Analyst, USAF, Vandenberg AFB, CA
1990 - 1992	Graduate Student, USAF, Air Force Institute of Technology
1992 - 1995	Scientific Analyst, USAF, Scott AFB, IL
1992 - 1993	Total Quality Management Instructor, USAF, Scott AFB, IL
1992 - 1995	Adjunct Professor, Belleville Area College, Belleville, IL
1996 - 1999	Senior Consultant, William E. Wecker Associates, Inc.
2000 -	Vice-President, Principal Consultant, William E. Wecker Associates, Inc.

HONORS

Meritorious Service Medal (MSM) while officer in US Air Force.

Air Mobility Command Officer of the Year, 1993.

Barchi Prize, 1994 Military Operations Research Society.

Best Application of Operations Research/Management Science Achievement Award, 1993. Institute of Management Science/Operations Research Society of America, St. Louis Gateway Chapter.

SELECT EXPERT REPORTS, TESTIMONY, DECLARATIONS AND PROCEEDINGS

- Expert for Visa and major US banks (e.g., Bank of America, Barclays, Capital One, Citibank, Fifth Third, HSBC, JPMorgan Chase, PNC, SunTrust, and Wells Fargo) in $30B class-action Payment Card Interchange Fee and Merchant Discount Antitrust Litigation. Issues involved damage calculations, payment card market analysis, profitability and big data analysis.

- Expert for Visa in litigation with payment card issuer. Issues involved damage calculations, breach of contract, consumer product performance, credit card market analysis and profitability.

- Expert for Major League Baseball, National Football League, National Basketball Association and Women's National Basketball Association in Cable Royalty Distribution Proceedings. Issues involved sample analysis of Nielsen data to determine the relative economic value of programming and the allocation of royalty revenues.

- Expert for Major League Baseball, National Football League, National Basketball Association and Women's National Basketball Association in Satellite Royalty Distribution Proceedings.

- Expert for Allianz SE Insurance Company in asbestos coverage litigation for historical products and operations claims. Issues involved sample design and analysis, products/operation insurance coverage, forecasting, and primary and excess insurance policy allocation analysis.

- Expert for BP Solar International, Inc. in class action litigation. Issues involved damages calculation, product failure analysis, sample design and analysis and forecasting.

- Expert for Chase Bank in litigation with major retail cobrand partner. Issues involved damages calculations, consumer product performance, forecasting, credit card market analysis and profitability of card portfolio.

- Expert for Altria Client Servicer LLC, testimony at the FDA's Tobacco Products Scientific Advisory Committee regarding a proposed "modified risk" claim.

- Presented my analysis to senior Pentagon officials, Joint Chiefs of Staff, all military four-star generals, all Air Force generals, and members of Congress to determine which aircraft to purchase to maximize capability across various warfighting scenarios. Awarded MSM.
- Expert for Countrywide Home Loans in class action litigation. Issues involved sample design and analysis.
- Expert for gun manufacturers in litigation on gun sales and tracing. Issues involved sample design and analysis, the relationship between gun availability and crime, and forecasting.
- Expert for R.J. Reynolds Tobacco Company in class action litigation. Issues involved epidemiology and data analysis. Estimated the relations between smoking cessation and disease risk.

PUBLICATIONS/PRESENTATIONS

"Constrained System Optimization and Capability Based Analysis" (with K. Bauer, J. Litko), <u>Military Operations Research</u> , Vol 2, No 4, 1997, pp. 5-19.

"Military Modeling and Simulation: Reflections and Directions", <u>1994 Winter Simulation Conference Proceedings</u>, pp. 741-743.

"Constrained System Optimization and Capability Based Analysis", 62nd Military Operations Research Society, National Meeting, 1993.

"Force Allocation Through Constrained Optimization", 61st Military Operations Research Society, National Meeting 1993. Awarded Best Working Group Paper.

"Experimental Design Considerations in the Optimization of Stochastic Response Surfaces", Sponsored Session presentation, TIMS/ORSA Joint National Meeting, Chicago 1993.

"C-141 Depot Maintenance: Using Simulation to define Resource Requirements" (with T. Schuppe, D. McElveen, P. Miyares), <u>Air Force Journal of Logistics</u>, Winter-Spring 1993, pp. 11-15.

"Force Allocation Through Constrained Optimization of Stochastic Response Surfaces" (with K. Bauer, J. Litko), <u>1992</u> <u>Winter Simulation Conference Proceedings</u>, pp. 1121-1129.

"C-141 Depot Maintenance: Using Simulation to Define Resource Requirements" (with T. Schuppe, D. McElveen, P. Miyares), <u>1992 Winter Simulation Conference Proceedings</u>, pp. 1145-1152.

Invited lectures at: University of Washington in St. Louis, University of St. Louis, United States Air Force Academy, Air Force Institute of Technology, and Pentagon Studies and Analysis group.

Appendix C: Figures showing ratios of maximum, average, and minimum Lindstrom distant viewing households divided by distant subscribers for every station 2010-2013

Maximum Lindstom Distant Viewers / Total Distant Subscribers by Station
2010
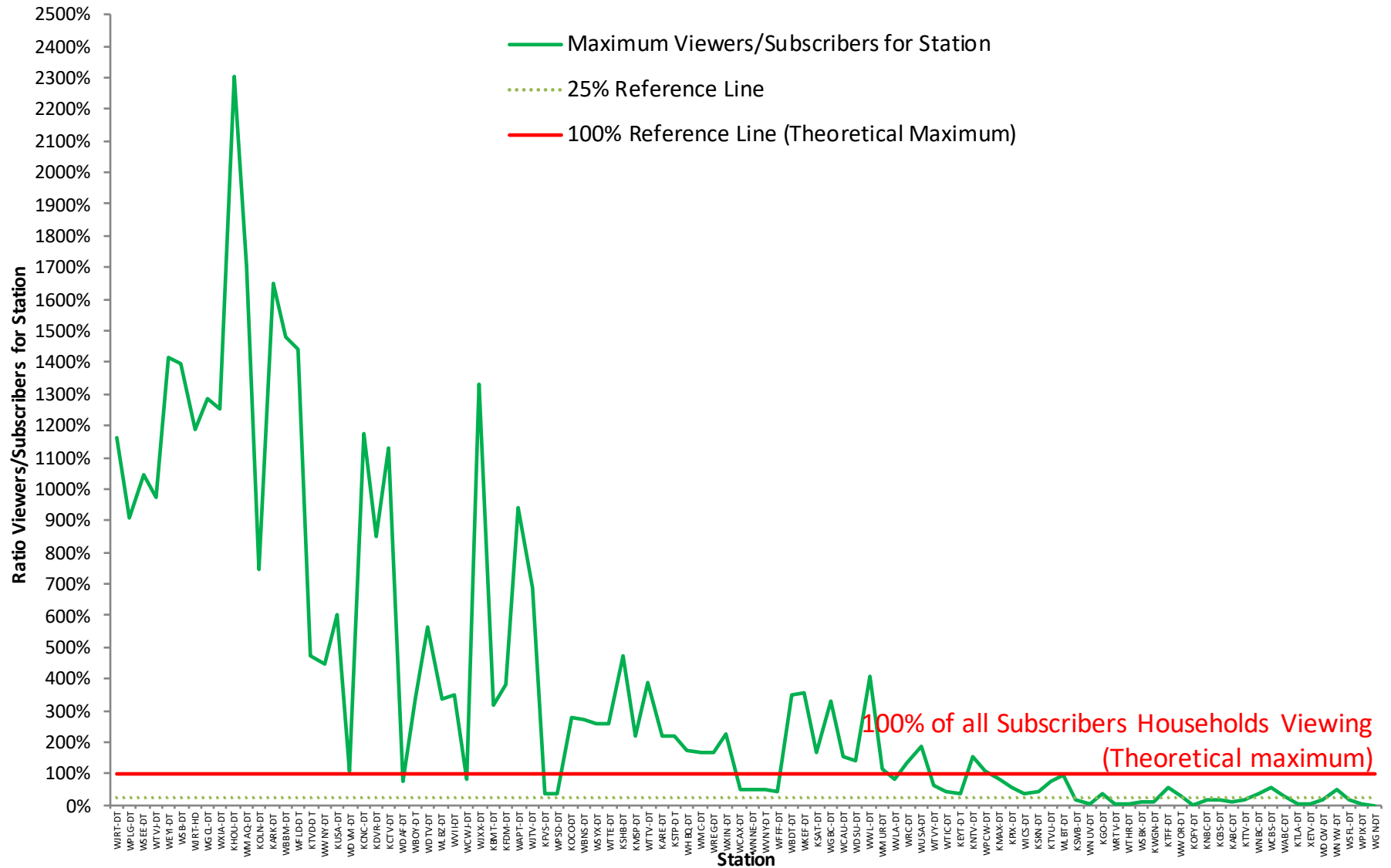
- Maximum Viewers/Subscribers for Station
- 25% Reference Line
- 100% Reference Line (Theoretical Maximum)

100% of all Subscribers Households Viewing
(Theoretical maximum)

Ratio Viewers/Subscribers for Station

Station

Average Lindstrom Distant Viewers / Total Distant Subscribers by Station 2010

Legend:
- Average Viewers/Subscribers for Station
- 25% Reference Line
- 100% Reference Line (Theoretical Maximum)

100% of all Subscribers Households Viewing (Theoretical maximum)

Y-axis: Ratio Viewers/Subscribers for Station

X-axis: Station
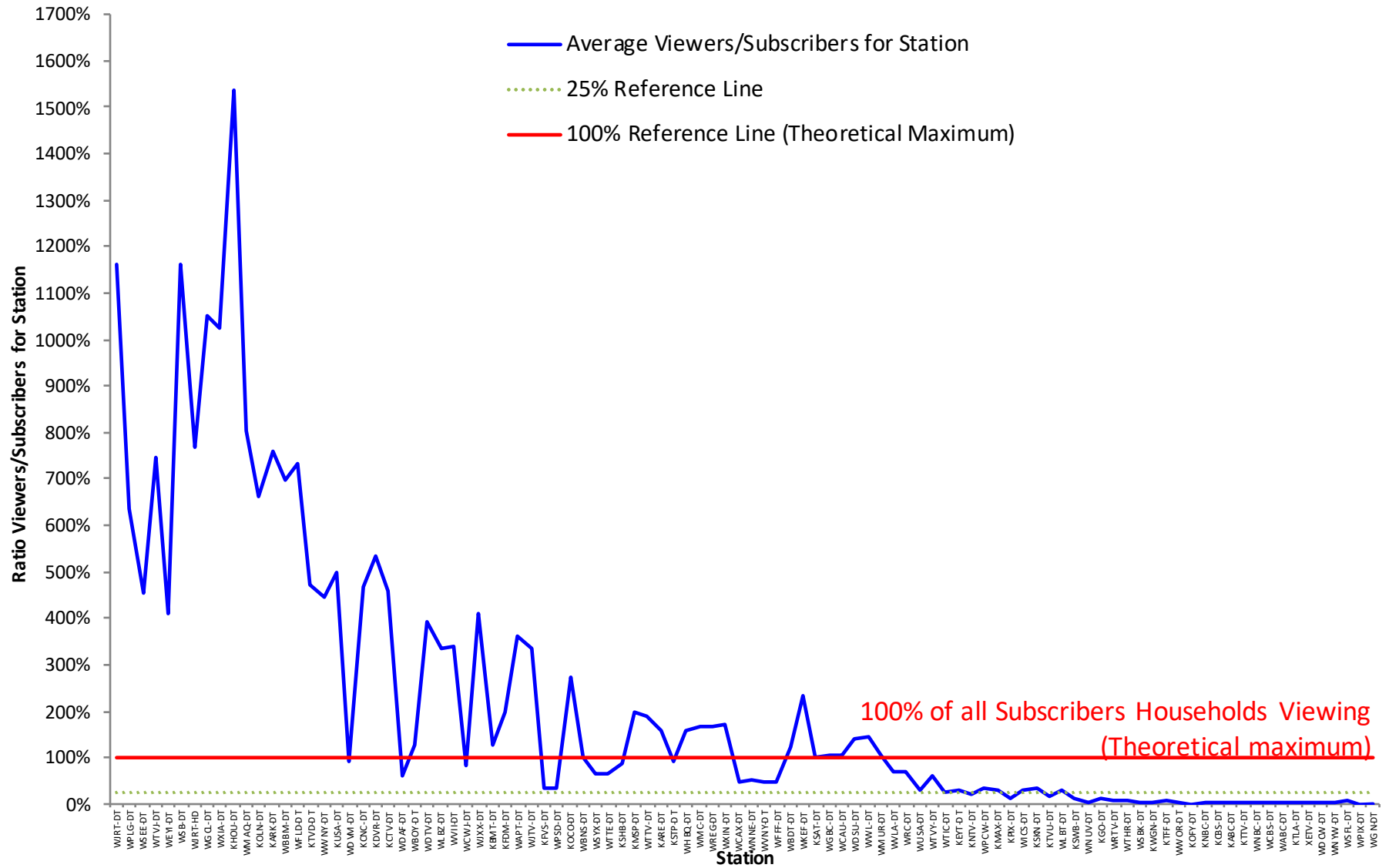
Minimum Lindstrom Distant Viewers / Total Distant Subscribers by Station 2010

Maximum Lindstrom Distant Viewers / Total Distant Subscribers by Station 2011
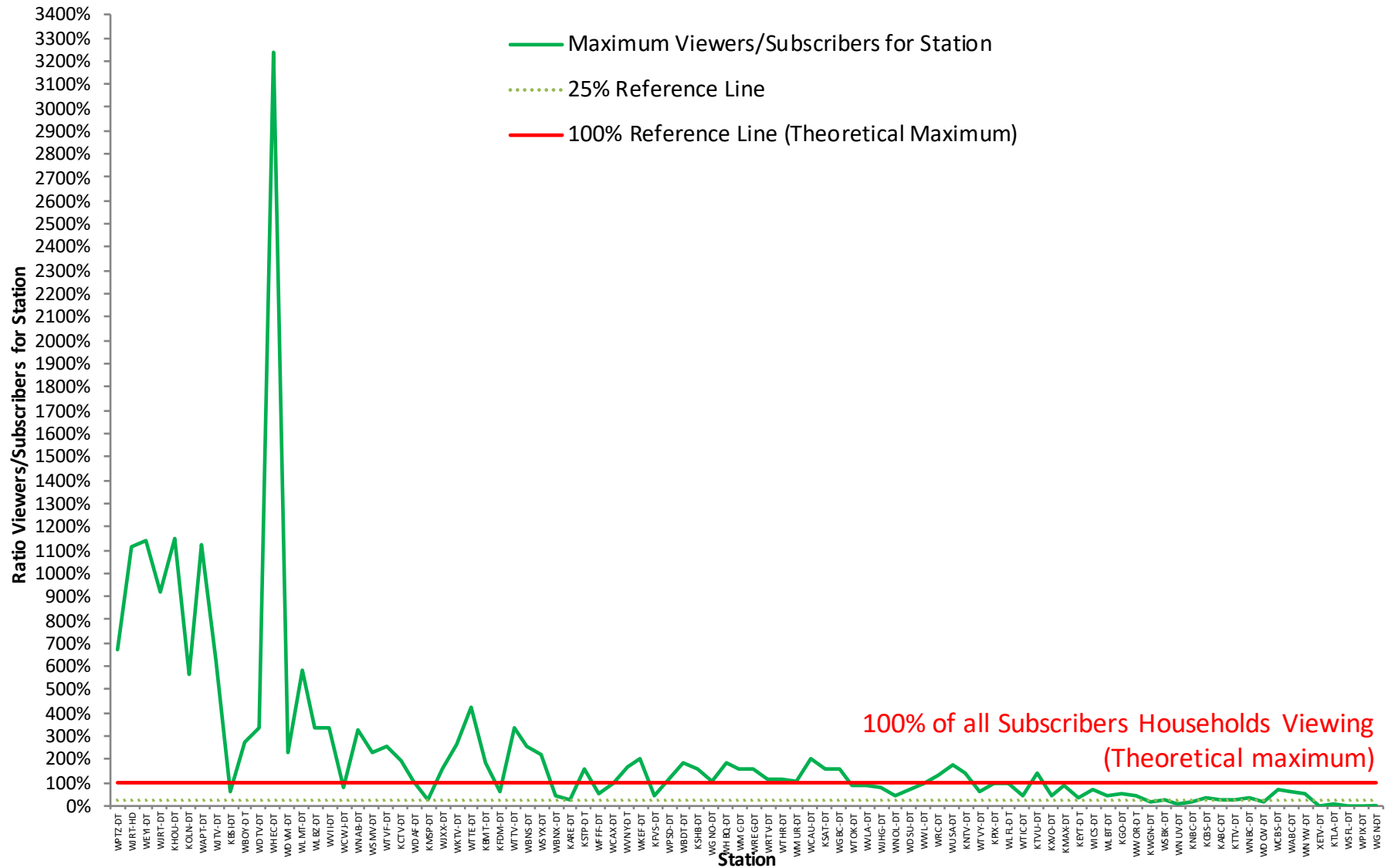
Legend:
- Maximum Viewers/Subscribers for Station
- 25% Reference Line
- 100% Reference Line (Theoretical Maximum)

100% of all Subscribers Households Viewing (Theoretical maximum)

Y-axis: Ratio Viewers/Subscribers for Station

X-axis: Station

**Average Lindstrom Distant Viewers / Total Distant Subscribers by Station
2011**

Legend:
- Average Viewers/Subscribers for Station
- 25% Reference Line
- 100% Reference Line (Theoretical Maximum)

100% of all Subscribers Households Viewing
(Theoretical maximum)

Y-axis: Ratio Viewers/Subscribers for Station

X-axis: Station
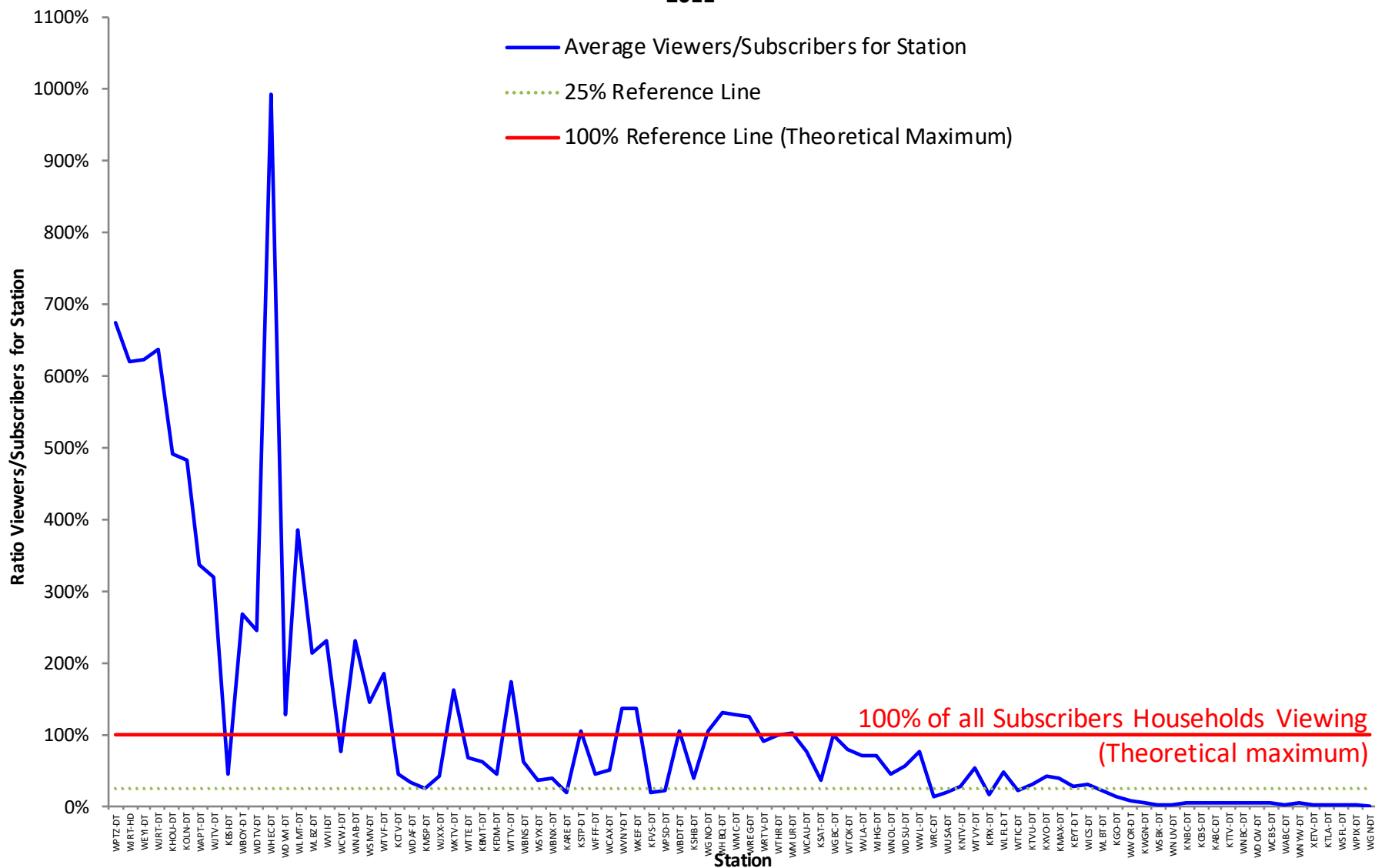
**Minimum Lindstrom Distant Viewers / Total Distant Subscribers by Station
2011**
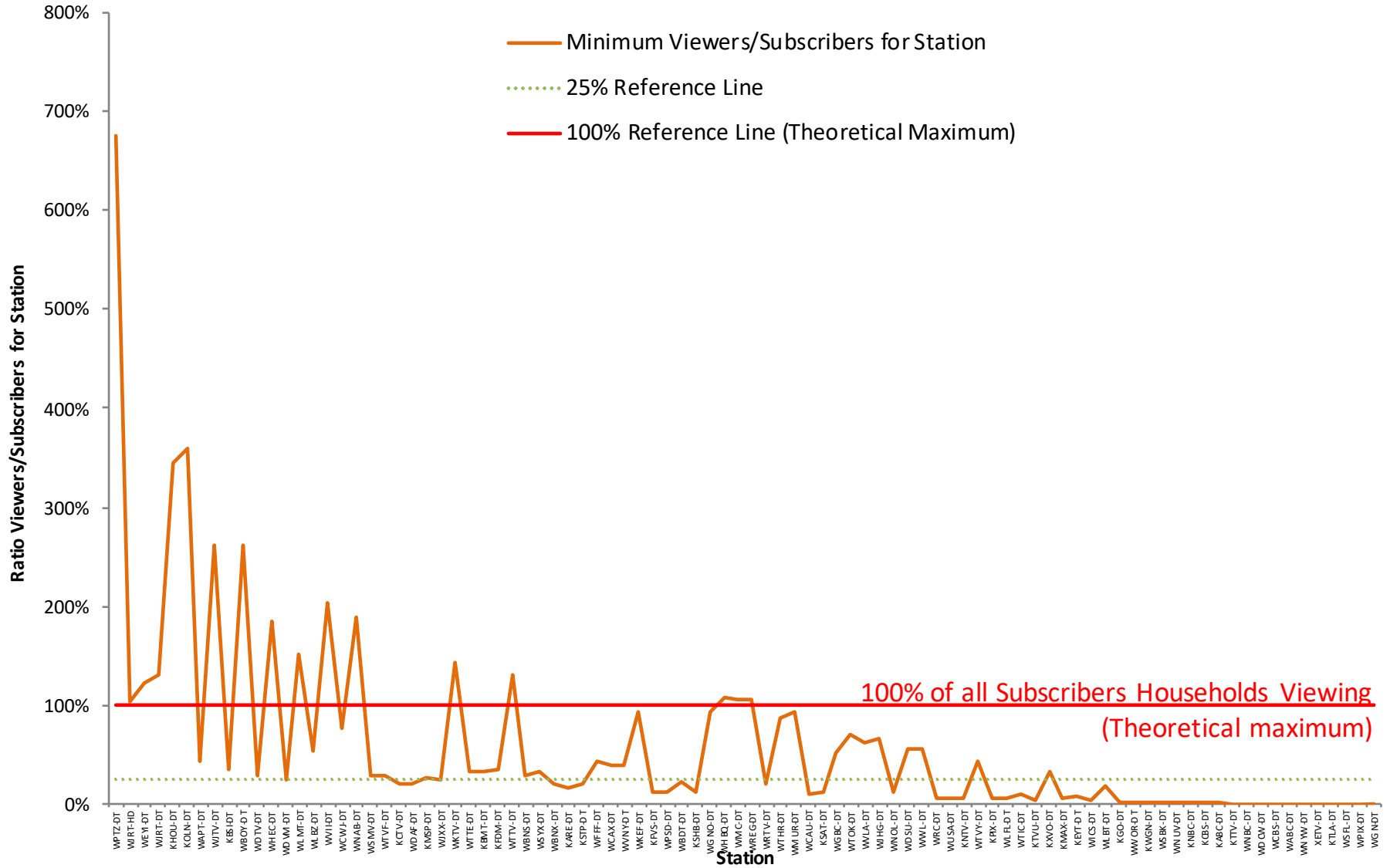
Maximum Lindstrom Distant Viewers / Total Distant Subscribers by Station 2012
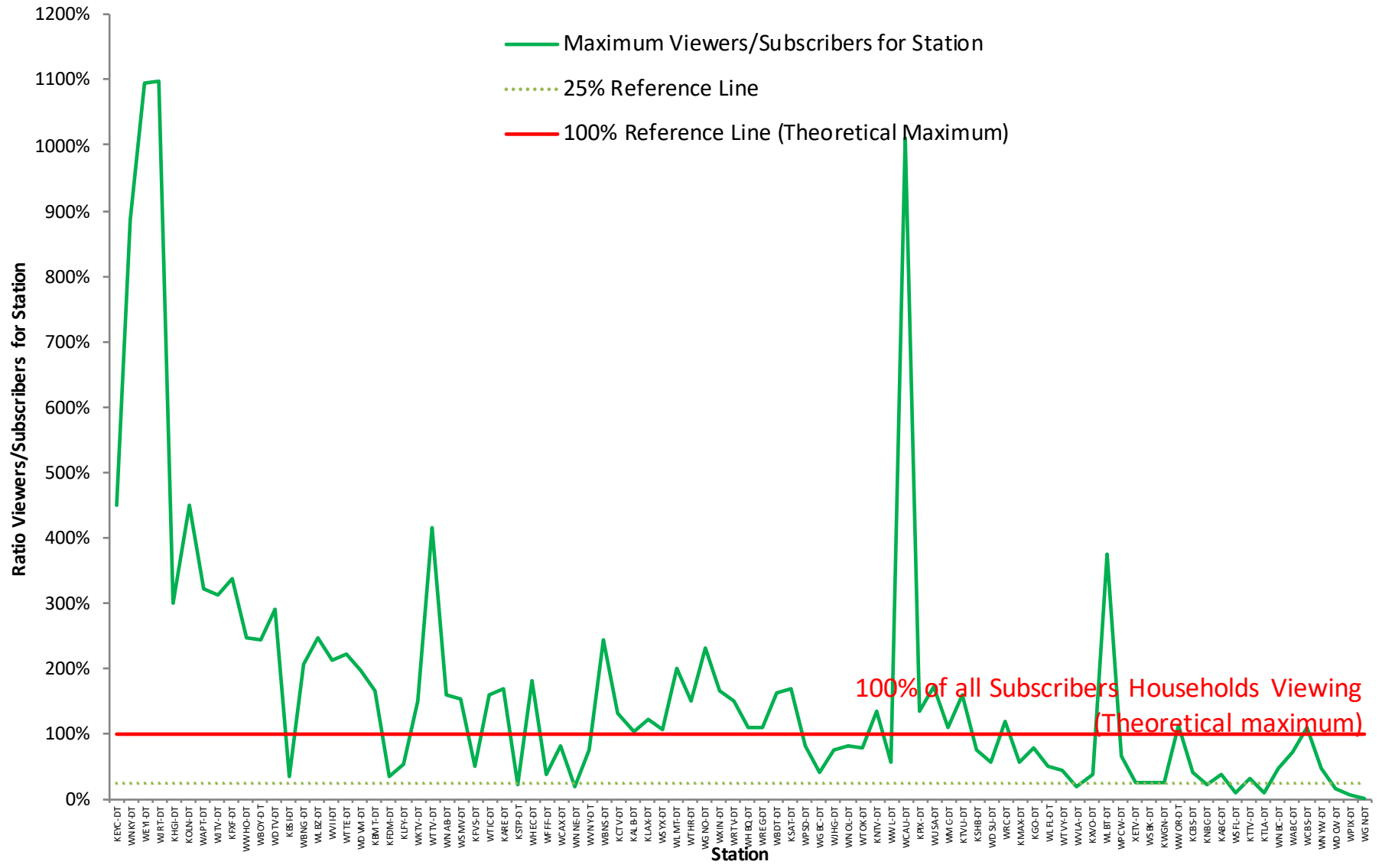
Average Lindstrom Distant Viewers / Total Distant Subscribers by Station 2012

- Average Viewers/Subscribers for Station
- 25% Reference Line
- 100% Reference Line (Theoretical Maximum)

100% of all Subscribers Households Viewing (Theoretical maximum)

Ratio Viewers/Subscribers for Station
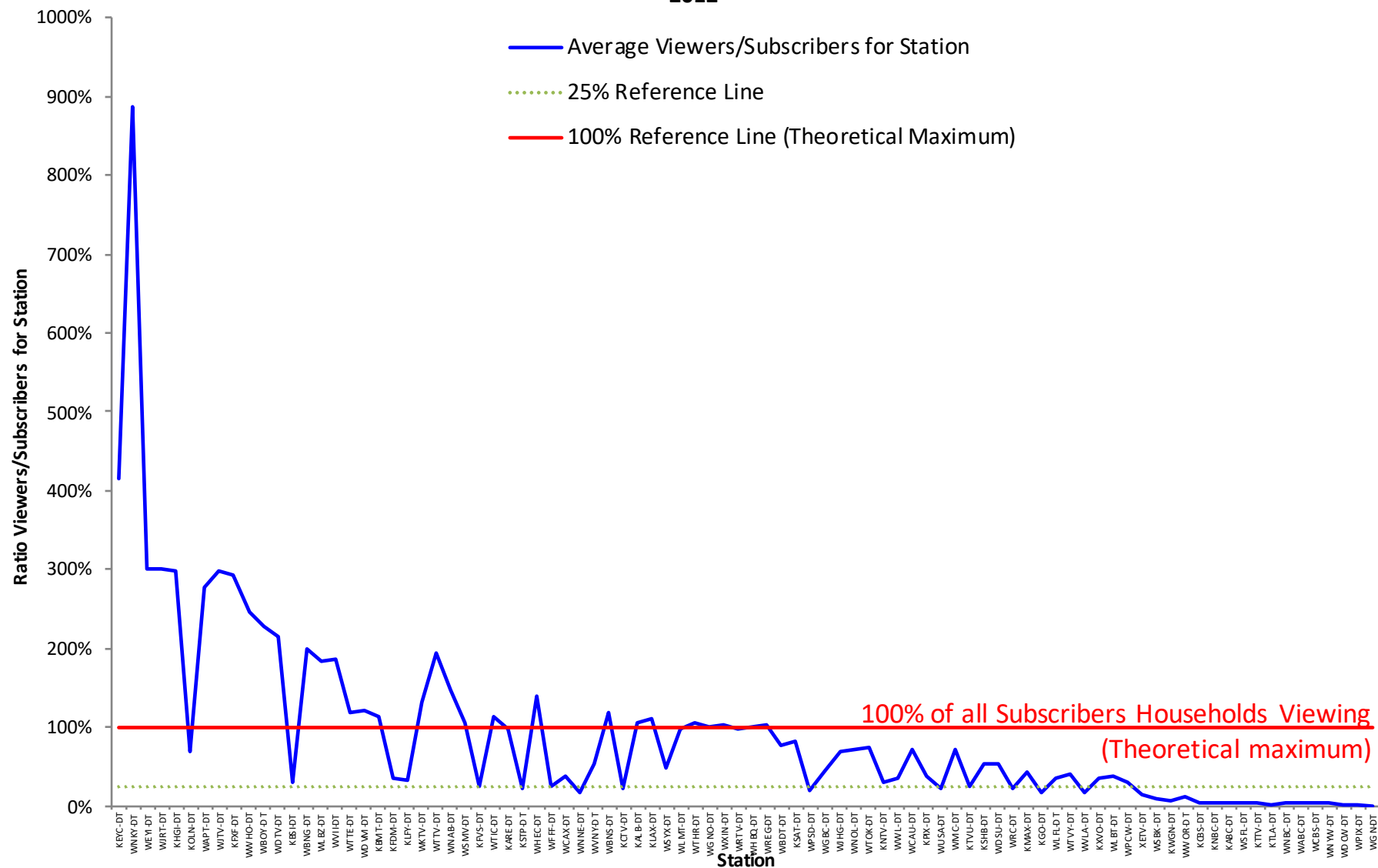
Station

Minimum Lindstrom Distant Viewers / Total Distant Subscribers by Station 2012
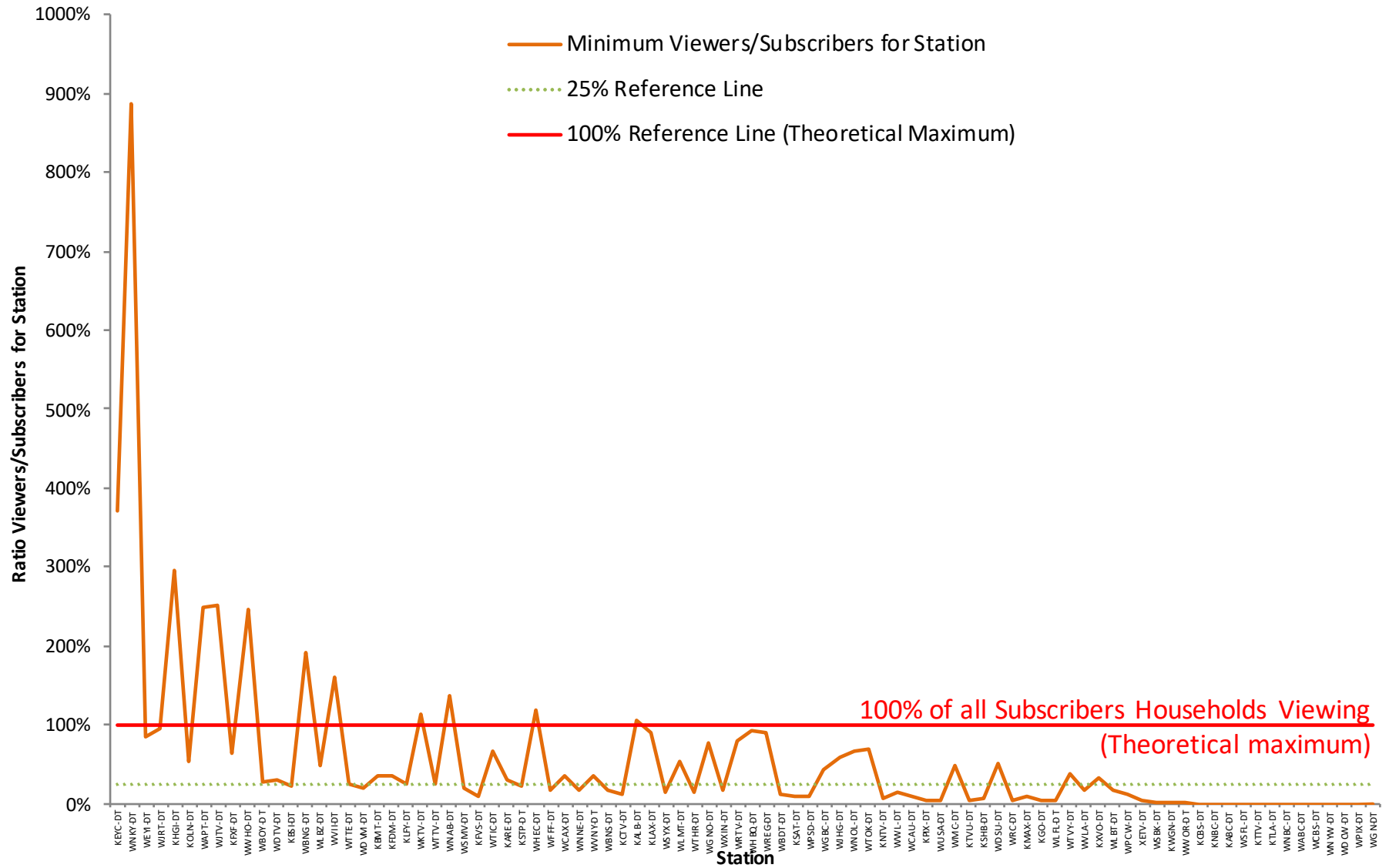
Maximum Lindstrom Distant Viewers / Total Distant Subscribers by Station 2013
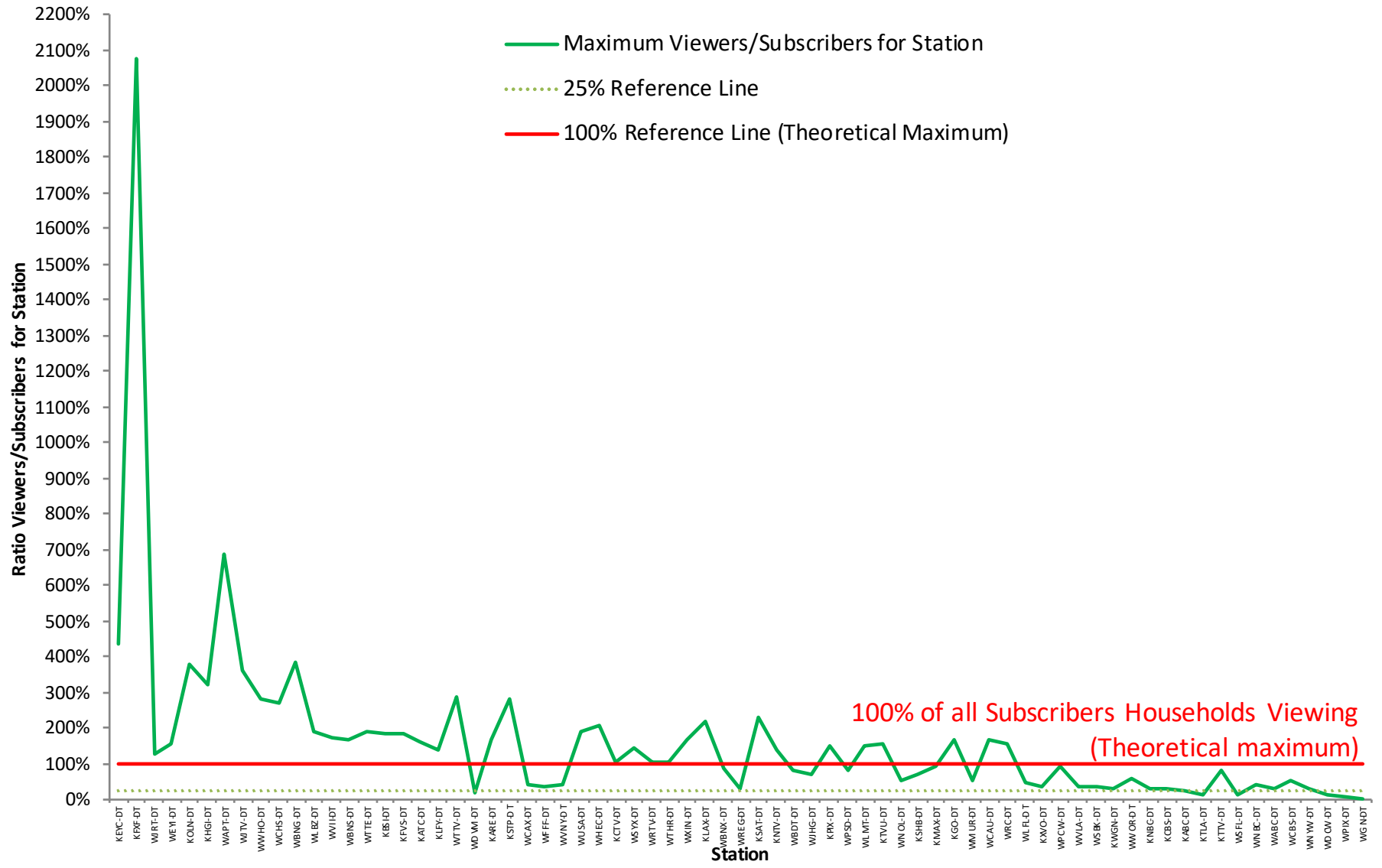
**Average Lindstrom Distant Viewers / Total Distant Subscribers by Station
2013**
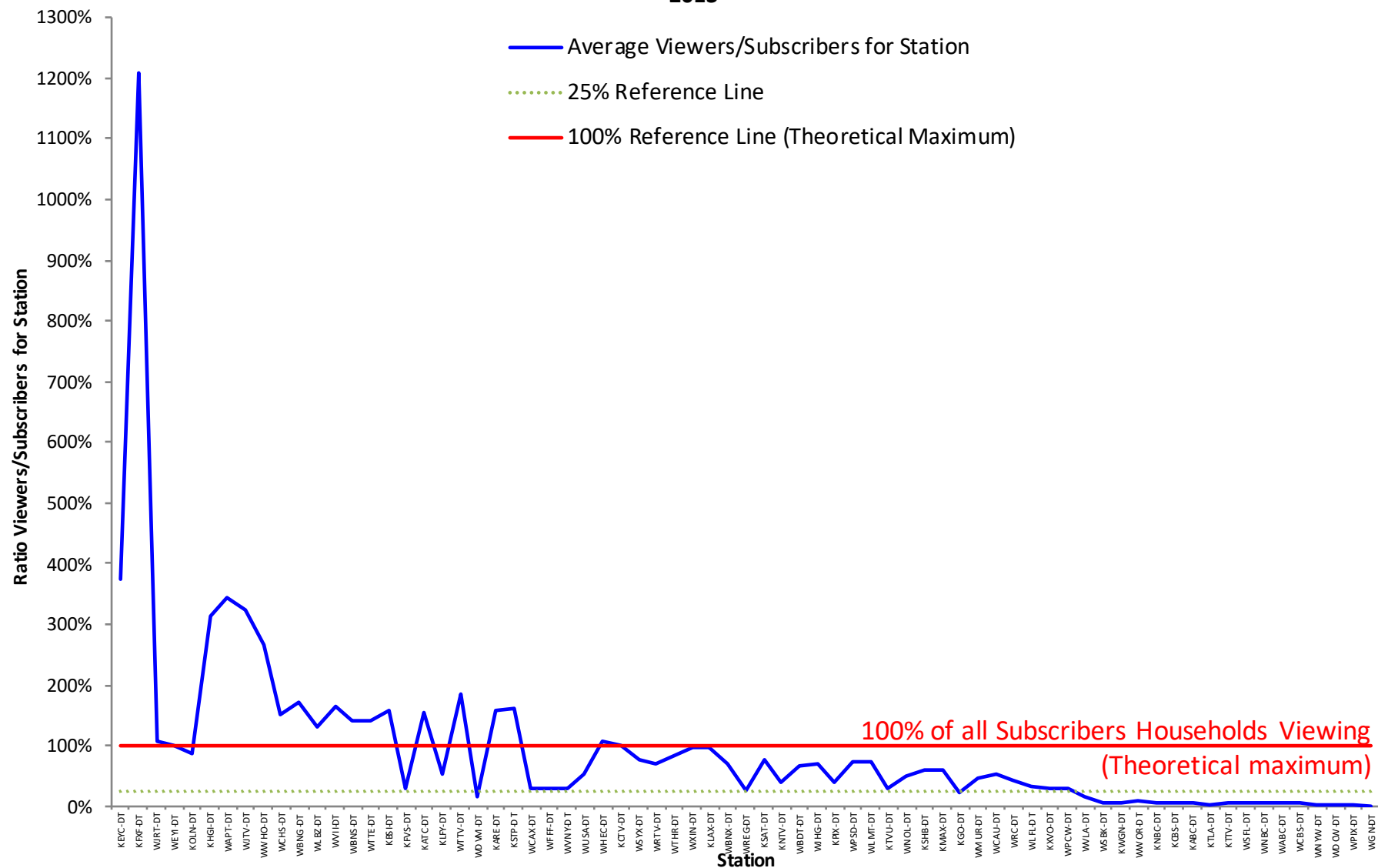
Minimum Lindstrom Distant Viewers / Total Distant Subscribers by Station
2013
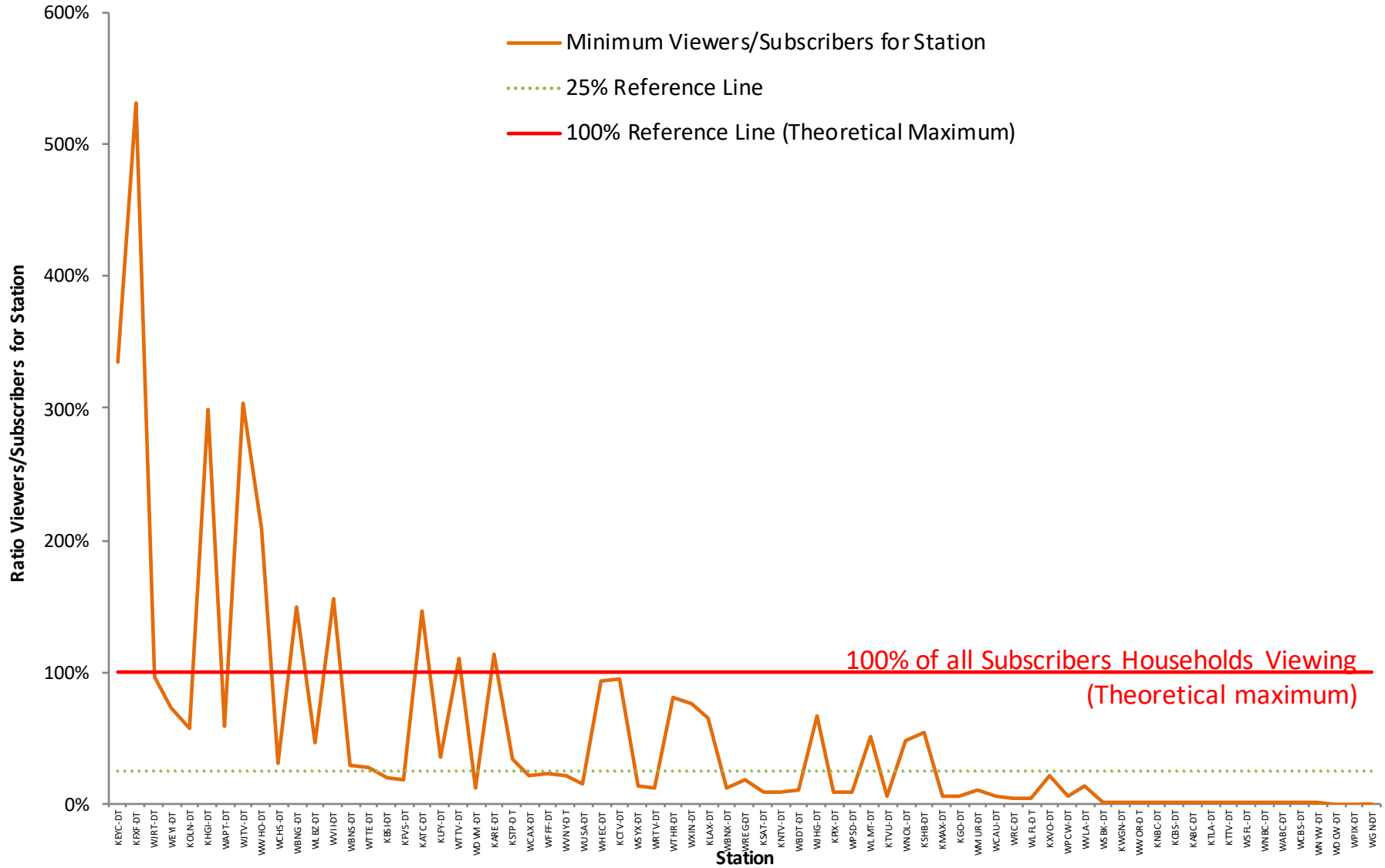
Appendix D: Figures showing every Lindstrom distant viewing record divided by the station's distant subscribers for 2010-2013

Ratio of Nielsen Distant Viewing Estimates Divided by Total Distant Subscribers
2010
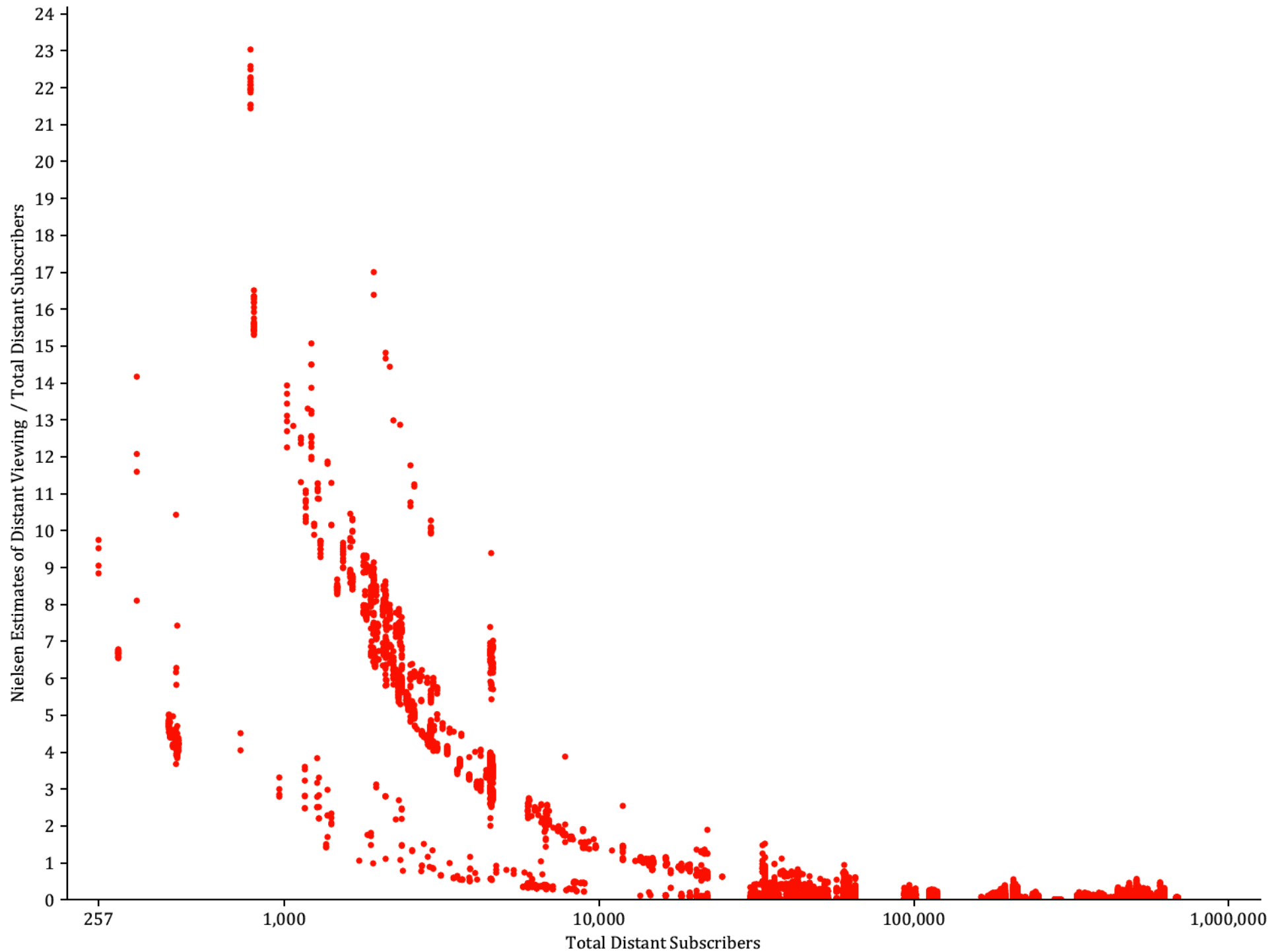
Ratio of Nielsen Distant Viewing Estimates Divided by Total Distant Subscribers
2011
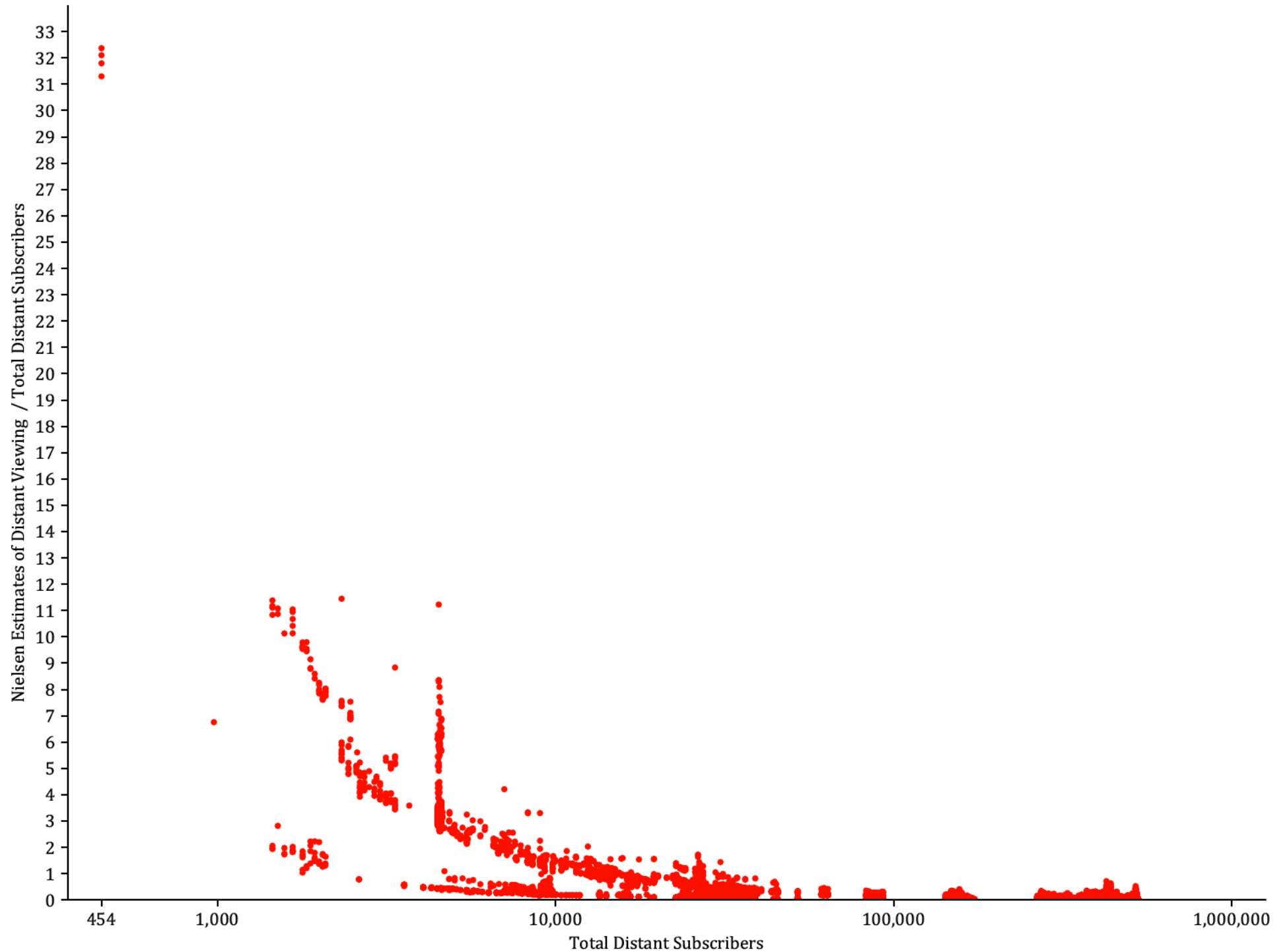
Ratio of Nielsen Distant Viewing Estimates Divided by Total Distant Subscribers
2012
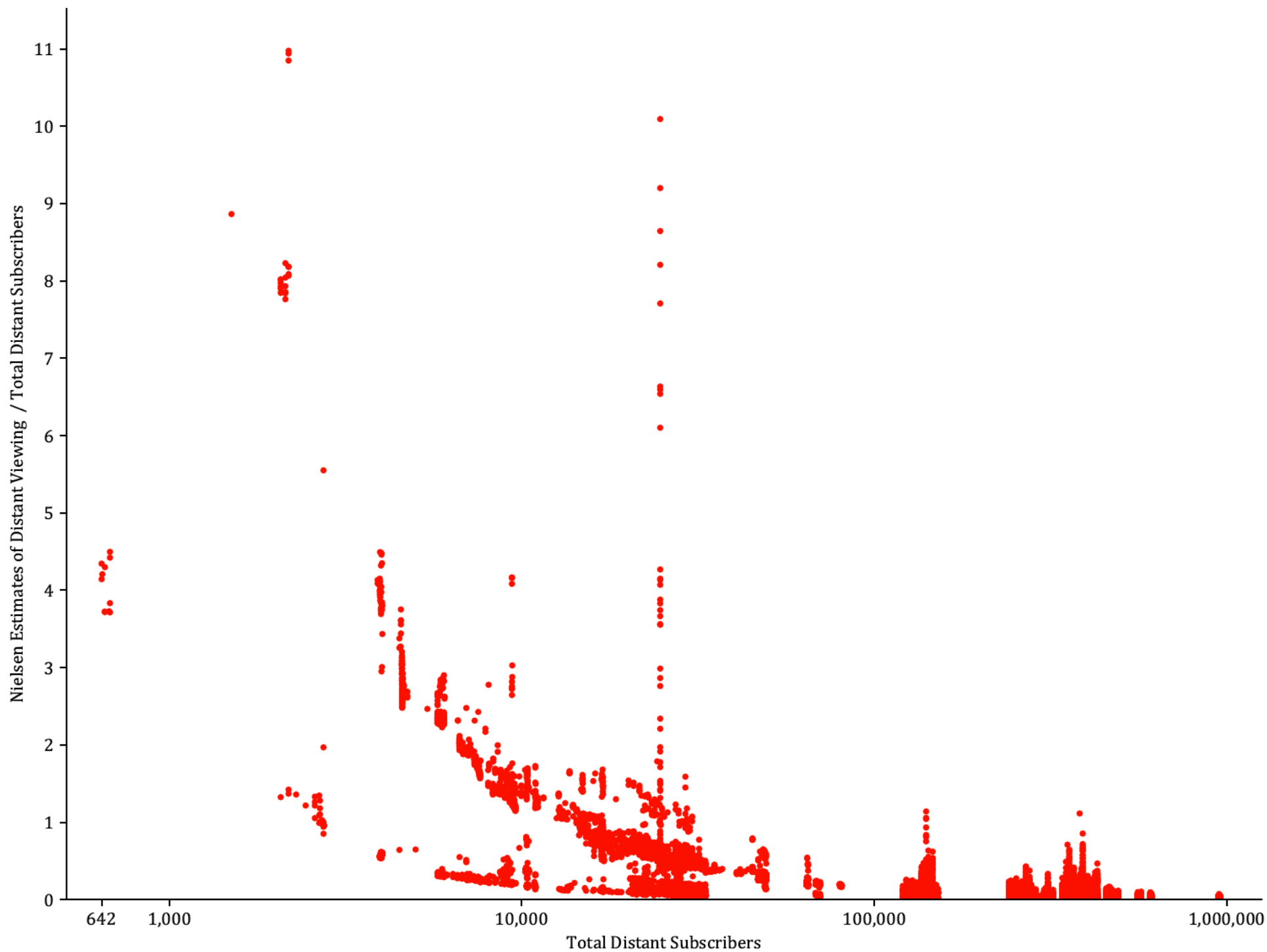
Ratio of Nielsen Distant Viewing Estimates Divided by Total Distant Subscribers
2013

Nielsen Estimates of Distant Viewing / Total Distant Subscribers

Total Distant Subscribers
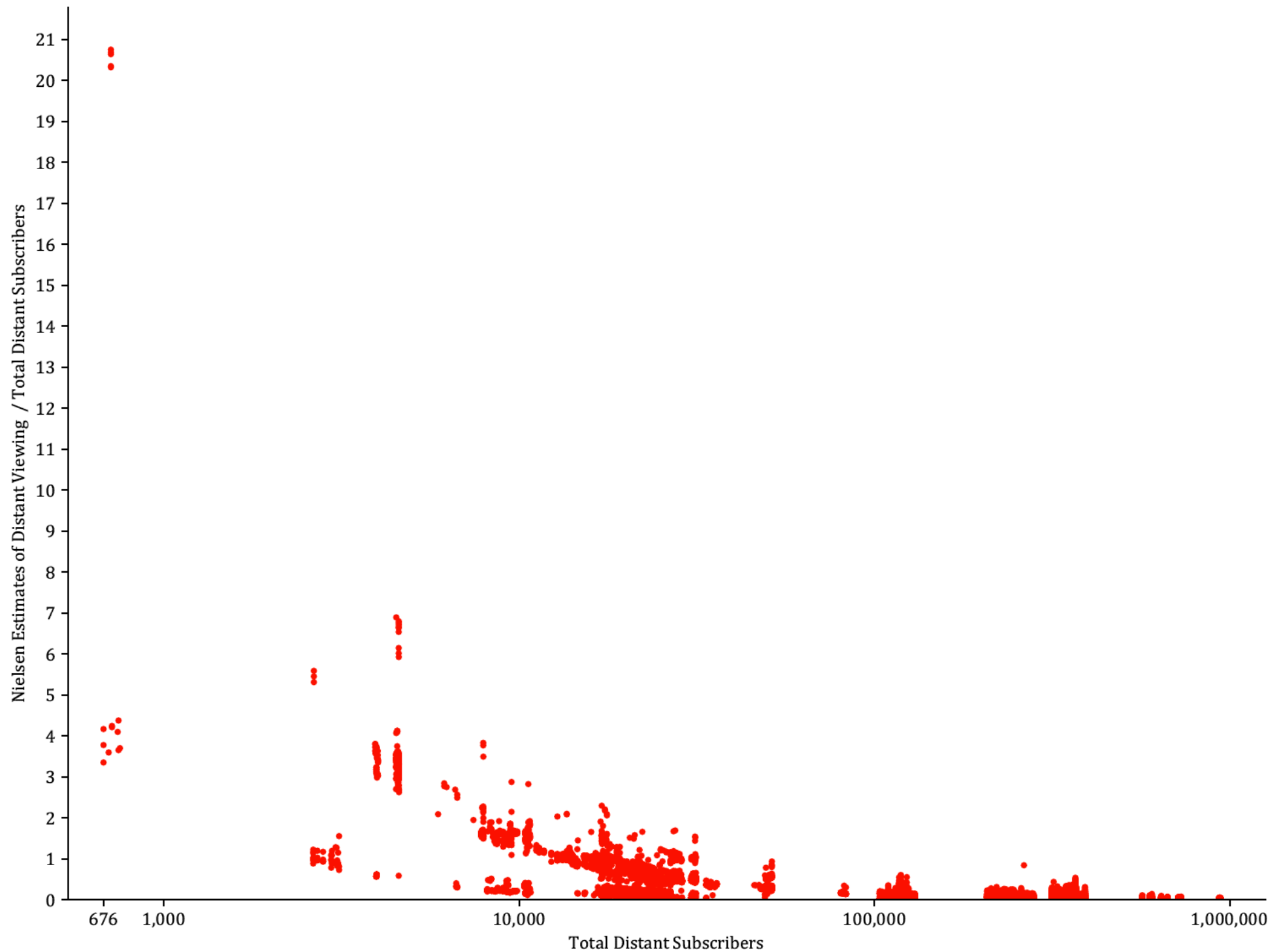
Appendix E: 326 records in the Gray data for paid programming (infomercials) where the Lindstrom data estimates of distant viewing households are larger than the total distant subscribers

APPENDIX E

**REDACTED - RESTRICTED PURSUANT TO
PROTECTIVE ORDER, 14-CRB-0011-SD (2010-13) (MAR. 31 2016)**

Appendix F: Dollars allocated to Program Suppliers compared to royalties paid (non-WGN stations)

	Station	Year	Actual Royalties	Gray Model 1 Royalty Allocation					Gray Royalty Allocation /Actual Royalties	Gray PS Royalty Allocation /Actual Royalties
				Com	Dev	PS	JSC	Total		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]=[4]+…[7]	[9]=[8]/[3]	[10]=[6]/[3]
1	KOTA-DT	2010	$ 310	$ 349	$ 26	$ 5,521	$ 878	$ 6,774	$ 21.85	$ 17.81
2	WSEE-DT	2010	$ 1,098	$ 1,084	$ 30	$ 16,959	$ 2,378	$ 20,450	$ 18.63	$ 15.45
3	WTVJ-DT	2010	$ 1,098	$ 1,741	$ -	$ 15,650	$ 1,837	$ 19,229	$ 17.52	$ 14.26
4	WPTZ-DT	2010	$ 422	$ 518	$ 11	$ 5,790	$ 1,042	$ 7,362	$ 17.42	$ 13.70
5	WPLG-DT	2010	$ 1,098	$ 2,041	$ -	$ 14,556	$ 2,297	$ 18,894	$ 17.22	$ 13.26
6	WJRT-DT	2010	$ 85	$ 176	$ -	$ 1,090	$ 421	$ 1,686	$ 19.84	$ 12.82
7	KOTA-DT	2011	$ 949	$ 877	$ 25	$ 11,894	$ 1,358	$ 14,154	$ 14.92	$ 12.54
8	WXIA-DT	2010	$ 942	$ 1,085	$ 30	$ 11,656	$ 672	$ 13,443	$ 14.27	$ 12.38
9	KEVN-DT	2010	$ 310	$ 575	$ 11	$ 3,750	$ 953	$ 5,288	$ 17.06	$ 12.10
10	WEYI-DT	2010	$ 1,816	$ 1,399	$ 50	$ 19,876	$ 2,915	$ 24,240	$ 13.35	$ 10.95
11	KTFF-DT	2010	$ 206,176	$ 12,689	$ 18,513	$ 2,181,119	$ 80,605	$ 2,292,926	$ 11.12	$ 10.58
12	WPTZ-DT	2011	$ 3,093	$ 3,031	$ 28	$ 30,497	$ 3,763	$ 37,319	$ 12.06	$ 9.86
13	WJRT-HD	2010	$ 1,731	$ 2,864	$ 13	$ 16,818	$ 2,894	$ 22,589	$ 13.05	$ 9.72
14	KHOU-DT	2010	$ 2,910	$ 3,847	$ 127	$ 28,188	$ 3,572	$ 35,734	$ 12.28	$ 9.69
15	KOLN-DT	2010	$ 3,290	$ 3,411	$ 11	$ 31,540	$ 4,002	$ 38,964	$ 11.84	$ 9.59
16	WMAQ-DT	2010	$ 2,784	$ 3,585	$ 15	$ 25,876	$ 3,899	$ 33,375	$ 11.99	$ 9.29
17	WSB-DT	2010	$ 850	$ 1,591	$ 6	$ 7,893	$ 777	$ 10,266	$ 12.08	$ 9.29
18	WBBM-DT	2010	$ 3,068	$ 2,877	$ 12	$ 28,244	$ 3,856	$ 34,990	$ 11.41	$ 9.21
19	WWNY-DT	2010	$ 3,888	$ 3,009	$ 43	$ 35,601	$ 4,529	$ 43,181	$ 11.11	$ 9.16
20	WGCL-DT	2010	$ 896	$ 1,045	$ 320	$ 8,192	$ 3,585	$ 13,142	$ 14.66	$ 9.14
21	WVII-DT	2010	$ 5,721	$ 1,959	$ 201	$ 51,153	$ 8,232	$ 61,545	$ 10.76	$ 8.94
22	WBOY-DT	2010	$ 5,394	$ 4,746	$ 153	$ 47,871	$ 6,492	$ 59,262	$ 10.99	$ 8.88
23	KARK-DT	2010	$ 3,008	$ 3,538	$ 106	$ 26,247	$ 4,718	$ 34,610	$ 11.51	$ 8.73
24	KUSA-DT	2010	$ 7,250	$ 10,031	$ 3	$ 61,938	$ 6,528	$ 78,500	$ 10.83	$ 8.54
25	WLBZ-DT	2010	$ 5,721	$ 5,679	$ 19	$ 48,102	$ 6,813	$ 60,614	$ 10.60	$ 8.41
26	KCNC-DT	2010	$ 7,380	$ 8,845	$ 2	$ 62,041	$ 10,401	$ 81,288	$ 11.01	$ 8.41
27	WEYI-DT	2011	$ 5,470	$ 3,868	$ 47	$ 45,209	$ 5,874	$ 54,999	$ 10.05	$ 8.26
28	KMGH-DT	2010	$ 7,313	$ 9,805	$ 6	$ 60,310	$ 8,278	$ 78,399	$ 10.72	$ 8.25
29	WDTV-DT	2010	$ 5,394	$ 4,780	$ 135	$ 44,149	$ 6,489	$ 55,553	$ 10.30	$ 8.19
30	KTBY-DT	2010	$ 2,058	$ 626	$ 127	$ 16,511	$ 1,310	$ 18,574	$ 9.03	$ 8.02
31	WLS-DT	2010	$ 4,612	$ 6,513	$ 28	$ 36,640	$ 5,622	$ 48,804	$ 10.58	$ 7.94
32	WDVM-DT	2010	$ 4,682	$ 5,599	$ 460	$ 37,107	$ 6,488	$ 49,654	$ 10.61	$ 7.93

	Station	Year	Actual Royalties	Gray Model 1 Royalty Allocation					Gray Royalty Allocation /Actual Royalties	Gray PS Royalty Allocation /Actual Royalties
				Com	Dev	PS	JSC	Total		
33	WBNX-DT	2010	$ 1,256	$ 11	$ 153	$ 9,939	$ -	$ 10,103	$ 8.04	$ 7.91
34	KCTV-DT	2010	$ 5,093	$ 6,908	$ 50	$ 40,084	$ 6,153	$ 53,194	$ 10.44	$ 7.87
35	WJRT-HD	2011	$ 2,458	$ 3,518	$ 12	$ 19,174	$ 2,153	$ 24,857	$ 10.11	$ 7.80
36	KREN-DT	2010	$ 28,705	$ -	$ -	$ 223,857	$ 8,902	$ 232,758	$ 8.11	$ 7.80
37	KEVN-DT	2011	$ 949	$ 1,315	$ 10	$ 7,259	$ 1,642	$ 10,226	$ 10.78	$ 7.65
38	WKTV-DT	2010	$ 7,269	$ 6,013	$ 63	$ 55,583	$ 8,185	$ 69,843	$ 9.61	$ 7.65
39	WAPT-DT	2010	$ 13,636	$ 10,576	$ 652	$ 103,146	$ 14,489	$ 128,863	$ 9.45	$ 7.56
40	WJTV-DT	2010	$ 13,636	$ 10,836	$ 453	$ 102,383	$ 20,945	$ 134,616	$ 9.87	$ 7.51
41	WJRT-DT	2011	$ 3,012	$ 4,212	$ 12	$ 22,558	$ 3,769	$ 30,551	$ 10.14	$ 7.49
42	WPSD-DT	2010	$ 9,220	$ 7,803	$ 301	$ 68,913	$ 11,937	$ 88,954	$ 9.65	$ 7.47
43	KFDM-DT	2010	$ 7,526	$ 6,996	$ 1,938	$ 55,884	$ 7,757	$ 72,575	$ 9.64	$ 7.42
44	KFXF-DT	2010	$ 7,642	$ 267	$ 369	$ 56,375	$ 8,521	$ 65,532	$ 8.58	$ 7.38
45	WBOY-DT	2011	$ 7,083	$ 5,664	$ 59	$ 52,251	$ 5,438	$ 63,413	$ 8.95	$ 7.38
46	WNNE-DT	2010	$ 25,390	$ 15,213	$ 240	$ 185,191	$ 19,887	$ 220,531	$ 8.69	$ 7.29
47	KFVS-DT	2010	$ 9,220	$ 5,103	$ 200	$ 67,241	$ 8,749	$ 81,294	$ 8.82	$ 7.29
48	WBNG-DT	2010	$ 1,001	$ 916	$ 40	$ 7,235	$ 1,594	$ 9,785	$ 9.78	$ 7.23
49	KHOU-DT	2011	$ 7,814	$ 10,143	$ 43	$ 56,058	$ 8,584	$ 74,827	$ 9.58	$ 7.17
50	KBMT-DT	2010	$ 7,526	$ 5,425	$ 489	$ 53,840	$ 9,530	$ 69,284	$ 9.21	$ 7.15
51	WVII-DT	2011	$ 17,096	$ 8,296	$ 193	$ 122,074	$ 15,133	$ 145,696	$ 8.52	$ 7.14
52	KOLN-DT	2011	$ 9,684	$ 9,590	$ 18	$ 69,015	$ 10,236	$ 88,859	$ 9.18	$ 7.13
53	WBNS-DT	2010	$ 19,093	$ 18,084	$ 15	$ 135,991	$ 25,027	$ 179,118	$ 9.38	$ 7.12
54	KSHB-DT	2010	$ 11,619	$ 10,419	$ 43	$ 82,620	$ 11,990	$ 105,072	$ 9.04	$ 7.11
55	KARE-DT	2010	$ 22,065	$ 20,832	$ 457	$ 155,382	$ 19,595	$ 196,266	$ 8.89	$ 7.04
56	WJXX-DT	2010	$ 4,762	$ 4,652	$ 87	$ 33,261	$ 6,868	$ 44,869	$ 9.42	$ 6.98
57	WLBZ-DT	2011	$ 17,096	$ 15,775	$ 39	$ 118,034	$ 14,593	$ 148,441	$ 8.68	$ 6.90
58	WAPT-DT	2011	$ 13,606	$ 13,245	$ 222	$ 93,925	$ 11,249	$ 118,641	$ 8.72	$ 6.90
59	KOCO-DT	2010	$ 1,496	$ 1,121	$ 33	$ 10,245	$ 3,913	$ 15,312	$ 10.24	$ 6.85
60	KTVD-DT	2010	$ 6,892	$ 6,473	$ 62	$ 46,427	$ 129	$ 53,090	$ 7.70	$ 6.74
61	WSYX-DT	2010	$ 19,093	$ 14,996	$ 273	$ 126,255	$ 20,303	$ 161,827	$ 8.48	$ 6.61
62	WVNY-DT	2010	$ 25,390	$ 6,955	$ 988	$ 167,450	$ 25,087	$ 200,480	$ 7.90	$ 6.60
63	WJTV-DT	2011	$ 13,606	$ 11,792	$ 84	$ 89,214	$ 15,949	$ 117,039	$ 8.60	$ 6.56
64	WCAX-DT	2010	$ 25,390	$ 17,024	$ 147	$ 166,241	$ 29,666	$ 213,078	$ 8.39	$ 6.55
65	WPTZ-DT	2012	$ 6,498	$ 3,593	$ 26	$ 42,353	$ 4,229	$ 50,202	$ 7.73	$ 6.52

	Station	Year	Actual Royalties	Gray Model 1 Royalty Allocation					Gray Royalty Allocation /Actual Royalties	Gray PS Royalty Allocation /Actual Royalties
				Com	Dev	PS	JSC	Total		
66	WHEC-DT	2011	$ 5,466	$ 4,484	$ 89	$ 35,402	$ 7,245	$ 47,220	$ 8.64	$ 6.48
67	WMC-DT	2010	$ 13,200	$ 12,541	$ 172	$ 84,623	$ 14,384	$ 111,720	$ 8.46	$ 6.41
68	KOTA-DT	2012	$ 1,288	$ 613	$ 17	$ 8,220	$ 841	$ 9,691	$ 7.52	$ 6.38
69	WCWJ-DT	2010	$ 4,762	$ 1,524	$ 1,525	$ 30,341	$ 1,000	$ 34,390	$ 7.22	$ 6.37
70	WNNE-DT	2011	$ 28,188	$ 17,850	$ 155	$ 179,481	$ 21,358	$ 218,844	$ 7.76	$ 6.37
71	WFLD-DT	2010	$ 3,180	$ 5,846	$ 61	$ 20,231	$ 6,722	$ 32,860	$ 10.33	$ 6.36
72	WTOK-DT	2010	$ 17,758	$ 9,828	$ 926	$ 112,517	$ 18,607	$ 141,878	$ 7.99	$ 6.34
73	WKEF-DT	2011	$ 19,111	$ 9,917	$ 37	$ 120,931	$ 9,817	$ 140,703	$ 7.36	$ 6.33
74	WEYI-DT	2012	$ 7,733	$ 3,208	$ 38	$ 48,392	$ 5,011	$ 56,649	$ 7.33	$ 6.26
75	WDTV-DT	2011	$ 15,202	$ 12,160	$ 63	$ 94,963	$ 16,567	$ 123,752	$ 8.14	$ 6.25
76	WNKY-DT	2012	$ 776	$ 80	$ 55	$ 4,823	$ 919	$ 5,878	$ 7.58	$ 6.22
77	WKTV-DT	2011	$ 22,107	$ 15,368	$ 105	$ 136,939	$ 17,895	$ 170,308	$ 7.70	$ 6.19
78	WKEF-DT	2010	$ 4,573	$ 2,063	$ 13	$ 28,264	$ 4,009	$ 34,349	$ 7.51	$ 6.18
79	WBNG-DT	2011	$ 16,799	$ 13,148	$ 117	$ 103,443	$ 18,276	$ 134,984	$ 8.04	$ 6.16
80	WTTV-DT	2010	$ 20,229	$ 4,585	$ 138	$ 122,552	$ 2,545	$ 129,821	$ 6.42	$ 6.06
81	KALB-DT	2011	$ 7,879	$ 4,705	$ 1,582	$ 47,635	$ 9,621	$ 63,542	$ 8.06	$ 6.05
82	KHGI-DT	2011	$ 2,768	$ 3,131	$ 23	$ 16,639	$ 4,256	$ 24,048	$ 8.69	$ 6.01
83	WREG-DT	2010	$ 13,200	$ 14,894	$ 457	$ 79,127	$ 11,538	$ 106,016	$ 8.03	$ 5.99
84	WPSD-DT	2011	$ 29,309	$ 24,324	$ 352	$ 174,150	$ 27,025	$ 225,851	$ 7.71	$ 5.94
85	KFDM-DT	2011	$ 22,920	$ 21,468	$ 4,741	$ 134,486	$ 20,511	$ 181,206	$ 7.91	$ 5.87
86	KBMT-DT	2011	$ 22,920	$ 16,475	$ 426	$ 134,423	$ 19,122	$ 170,446	$ 7.44	$ 5.86
87	KARE-DT	2011	$ 27,104	$ 30,295	$ 158	$ 158,462	$ 22,304	$ 211,219	$ 7.79	$ 5.85
88	WJXX-DT	2011	$ 8,519	$ 7,730	$ 63	$ 49,786	$ 3,459	$ 61,038	$ 7.16	$ 5.84
89	WDVM-DT	2011	$ 16,492	$ 19,284	$ 3,632	$ 96,216	$ 16,309	$ 135,440	$ 8.21	$ 5.83
90	KDVR-DT	2010	$ 7,616	$ 10,734	$ 143	$ 44,392	$ 8,437	$ 63,706	$ 8.37	$ 5.83
91	WTVF-DT	2011	$ 6,066	$ 6,741	$ 40	$ 35,325	$ 6,675	$ 48,781	$ 8.04	$ 5.82
92	WLBZ-DT	2012	$ 22,860	$ 15,562	$ 27	$ 132,983	$ 13,232	$ 161,804	$ 7.08	$ 5.82
93	WBNS-DT	2011	$ 26,415	$ 25,384	$ 7	$ 153,603	$ 28,483	$ 207,477	$ 7.85	$ 5.81
94	WTHR-DT	2011	$ 39,454	$ 35,041	$ 93	$ 228,866	$ 28,203	$ 292,203	$ 7.41	$ 5.80
95	WNOL-DT	2010	$ 13,828	$ 1,202	$ 633	$ 80,199	$ 2,325	$ 84,359	$ 6.10	$ 5.80
96	KCTV-DT	2011	$ 18,490	$ 21,228	$ 22	$ 106,885	$ 18,341	$ 146,476	$ 7.92	$ 5.78
97	WVNY-DT	2011	$ 28,188	$ 14,071	$ 122	$ 162,689	$ 22,949	$ 199,831	$ 7.09	$ 5.77
98	KSAT-DT	2010	$ 30,132	$ 22,383	$ 1,208	$ 173,255	$ 26,937	$ 223,783	$ 7.43	$ 5.75

	Station	Year	Actual Royalties	Gray Model 1 Royalty Allocation					Gray Royalty Allocation /Actual Royalties	Gray PS Royalty Allocation /Actual Royalties
				Com	Dev	PS	JSC	Total		
99	WSMV-DT	2011	$ 6,066	$ 8,435	$ 75	$ 34,661	$ 7,793	$ 50,963	$ 8.40	$ 5.71
100	WTVH-DT	2011	$ 3,215	$ 2,626	$ 12	$ 18,319	$ 4,196	$ 25,152	$ 7.82	$ 5.70
101	WSYX-DT	2011	$ 26,415	$ 20,102	$ 77	$ 150,336	$ 23,759	$ 194,274	$ 7.35	$ 5.69
102	KFVS-DT	2011	$ 29,309	$ 13,662	$ 117	$ 166,441	$ 26,296	$ 206,517	$ 7.05	$ 5.68
103	WISE-DT	2012	$ 1,644	$ 532	$ 10	$ 9,330	$ 1,795	$ 11,667	$ 7.09	$ 5.67
104	WNNE-DT	2012	$ 32,510	$ 15,546	$ 113	$ 183,898	$ 18,143	$ 217,700	$ 6.70	$ 5.66
105	KSHB-DT	2011	$ 38,254	$ 34,355	$ 114	$ 215,478	$ 28,903	$ 278,851	$ 7.29	$ 5.63
106	KOTA-DT	2013	$ 1,491	$ 609	$ 9	$ 8,359	$ 739	$ 9,715	$ 6.51	$ 5.61
107	WBOY-DT	2012	$ 9,220	$ 5,306	$ 77	$ 51,675	$ 4,694	$ 61,751	$ 6.70	$ 5.60
108	KEYC-DT	2012	$ 2,071	$ 1,313	$ 42	$ 11,583	$ 1,651	$ 14,589	$ 7.04	$ 5.59
109	KSTP-DT	2010	$ 22,065	$ 29,821	$ 39	$ 122,502	$ 22,059	$ 174,420	$ 7.90	$ 5.55
110	WCAX-DT	2011	$ 28,188	$ 22,855	$ 47	$ 156,441	$ 26,915	$ 206,259	$ 7.32	$ 5.55
111	WTTE-DT	2010	$ 19,093	$ 13,325	$ 895	$ 105,760	$ 25,029	$ 145,009	$ 7.59	$ 5.54
112	WPTZ-DT	2013	$ 7,069	$ 3,643	$ 17	$ 39,133	$ 3,516	$ 46,310	$ 6.55	$ 5.54
113	WVLA-DT	2010	$ 8,443	$ 3,240	$ 210	$ 46,700	$ 8,490	$ 58,640	$ 6.95	$ 5.53
114	WHEC-DT	2012	$ 31,476	$ 18,528	$ 137	$ 173,931	$ 18,216	$ 210,812	$ 6.70	$ 5.53
115	WTOK-DT	2011	$ 52,390	$ 29,155	$ 934	$ 288,439	$ 34,152	$ 352,680	$ 6.73	$ 5.51
116	WCAU-DT	2010	$ 5,281	$ 4,525	$ 55	$ 28,969	$ 4,658	$ 38,207	$ 7.24	$ 5.49
117	KFXF-DT	2011	$ 13,470	$ 398	$ 223	$ 73,883	$ 13,334	$ 87,838	$ 6.52	$ 5.49
118	WVLA-DT	2011	$ 52,659	$ 27,287	$ 735	$ 288,695	$ 33,841	$ 350,559	$ 6.66	$ 5.48
119	WDSU-DT	2010	$ 23,201	$ 18,946	$ 82	$ 127,099	$ 21,862	$ 167,990	$ 7.24	$ 5.48
120	WWHO-DT	2011	$ 3,938	$ 28	$ 102	$ 21,417	$ 922	$ 22,468	$ 5.70	$ 5.44
121	WKTV-DT	2012	$ 28,484	$ 14,737	$ 53	$ 154,542	$ 16,151	$ 185,483	$ 6.51	$ 5.43
122	WWL-DT	2010	$ 23,201	$ 19,795	$ 57	$ 125,773	$ 20,276	$ 165,901	$ 7.15	$ 5.42
123	WDAF-DT	2010	$ 5,093	$ 10,680	$ -	$ 27,530	$ 8,746	$ 46,956	$ 9.22	$ 5.41
124	WMC-DT	2011	$ 39,184	$ 38,248	$ 234	$ 211,751	$ 29,708	$ 279,942	$ 7.14	$ 5.40
125	WGBC-DT	2010	$ 17,758	$ 2,000	$ -	$ 95,470	$ 24,319	$ 121,789	$ 6.86	$ 5.38
126	WJHG-DT	2010	$ 9,683	$ 6,077	$ 425	$ 52,052	$ 9,411	$ 67,965	$ 7.02	$ 5.38
127	KALB-DT	2012	$ 41,315	$ 19,676	$ 6,169	$ 221,326	$ 22,849	$ 270,020	$ 6.54	$ 5.36
128	WMUR-DT	2010	$ 42,902	$ 34,485	$ 92	$ 228,857	$ 40,409	$ 303,843	$ 7.08	$ 5.33
129	WTHR-DT	2012	$ 45,850	$ 33,044	$ 70	$ 244,233	$ 24,748	$ 302,095	$ 6.59	$ 5.33
130	KARE-DT	2012	$ 31,030	$ 24,687	$ 148	$ 164,727	$ 18,681	$ 208,244	$ 6.71	$ 5.31
131	WJHG-DT	2011	$ 58,454	$ 41,016	$ 929	$ 309,222	$ 39,051	$ 390,218	$ 6.68	$ 5.29

	Station	Year	Actual Royalties	Gray Model 1 Royalty Allocation					Gray Royalty Allocation /Actual Royalties	Gray PS Royalty Allocation /Actual Royalties
				Com	Dev	PS	JSC	Total		
132	WCAU-DT	2011	$ 45,046	$ 40,793	$ 160	$ 233,735	$ 32,291	$ 306,979	$ 6.81	$ 5.19
133	KSTP-DT	2011	$ 27,104	$ 36,209	$ 72	$ 140,345	$ 19,690	$ 196,317	$ 7.24	$ 5.18
134	WEYI-DT	2013	$ 9,507	$ 3,395	$ 20	$ 48,967	$ 4,716	$ 57,098	$ 6.01	$ 5.15
135	WPSD-DT	2012	$ 56,400	$ 36,442	$ 460	$ 289,289	$ 32,954	$ 359,146	$ 6.37	$ 5.13
136	WRTV-DT	2011	$ 39,454	$ 35,530	$ 343	$ 201,784	$ 28,228	$ 265,884	$ 6.74	$ 5.11
137	WUSA-DT	2010	$ 34,792	$ 25,252	$ 362	$ 177,371	$ 24,016	$ 227,001	$ 6.52	$ 5.10
138	WBDT-DT	2010	$ 4,573	$ 986	$ 64	$ 23,312	$ 380	$ 24,742	$ 5.41	$ 5.10
139	WMUR-DT	2011	$ 44,567	$ 42,309	$ 135	$ 226,759	$ 34,373	$ 303,575	$ 6.81	$ 5.09
140	WNNE-DT	2013	$ 33,998	$ 16,092	$ 76	$ 172,930	$ 15,470	$ 204,567	$ 6.02	$ 5.09
141	WNAB-DT	2011	$ 6,066	$ 1,976	$ 181	$ 30,750	$ -	$ 32,907	$ 5.42	$ 5.07
142	WDVM-DT	2012	$ 26,747	$ 20,856	$ 4,400	$ 135,501	$ 16,927	$ 177,684	$ 6.64	$ 5.07
143	KEYC-DT	2013	$ 2,317	$ 1,435	$ 18	$ 11,729	$ 1,497	$ 14,680	$ 6.34	$ 5.06
144	WLBZ-DT	2013	$ 26,200	$ 16,255	$ 34	$ 132,333	$ 12,190	$ 160,812	$ 6.14	$ 5.05
145	KSAT-DT	2011	$ 47,541	$ 40,414	$ 495	$ 239,601	$ 31,459	$ 311,968	$ 6.56	$ 5.04
146	KLFY-DT	2012	$ 25,944	$ 9,803	$ 142	$ 130,284	$ 15,507	$ 155,735	$ 6.00	$ 5.02
147	WGNO-DT	2011	$ 12,798	$ 10,133	$ 79	$ 63,827	$ 15,177	$ 89,216	$ 6.97	$ 4.99
148	WJHG-DT	2012	$ 62,224	$ 38,144	$ 1,143	$ 309,786	$ 33,686	$ 382,759	$ 6.15	$ 4.98
149	WVII-DT	2012	$ 22,860	$ 6,065	$ 181	$ 113,126	$ 12,064	$ 131,436	$ 5.75	$ 4.95
150	WLMT-DT	2011	$ 4,270	$ 2,928	$ 137	$ 20,877	$ 907	$ 24,850	$ 5.82	$ 4.89
151	WCAU-DT	2012	$ 72,301	$ 54,779	$ 85	$ 353,067	$ 37,947	$ 445,877	$ 6.17	$ 4.88
152	KNTV-DT	2012	$ 68,087	$ 47,512	$ 66	$ 332,444	$ 39,750	$ 419,772	$ 6.17	$ 4.88
153	WJTV-DT	2012	$ 14,240	$ 9,170	$ 57	$ 69,428	$ 11,340	$ 89,995	$ 6.32	$ 4.88
154	KATC-DT	2012	$ 25,944	$ 10,331	$ 141	$ 126,119	$ 13,373	$ 149,964	$ 5.78	$ 4.86
155	KLFY-DT	2013	$ 29,922	$ 10,281	$ 326	$ 145,307	$ 16,722	$ 172,635	$ 5.77	$ 4.86
156	WREG-DT	2011	$ 39,184	$ 43,954	$ 232	$ 189,991	$ 31,643	$ 265,820	$ 6.78	$ 4.85
157	WTVY-DT	2010	$ 12,302	$ 6,824	$ 176	$ 59,577	$ 12,773	$ 79,350	$ 6.45	$ 4.84
158	WFFF-DT	2010	$ 25,415	$ 14,679	$ 283	$ 122,878	$ 28,171	$ 166,011	$ 6.53	$ 4.83
159	KBSI-DT	2011	$ 2,324	$ 1,333	$ 428	$ 11,195	$ 2,379	$ 15,335	$ 6.60	$ 4.82
160	KOLN-DT	2012	$ 12,321	$ 9,075	$ 20	$ 59,318	$ 8,241	$ 76,654	$ 6.22	$ 4.81
161	WDSU-DT	2011	$ 72,281	$ 57,886	$ 228	$ 347,504	$ 46,867	$ 452,485	$ 6.26	$ 4.81
162	WTVY-DT	2011	$ 79,964	$ 50,176	$ 390	$ 382,419	$ 62,078	$ 495,063	$ 6.19	$ 4.78
163	KATC-DT	2013	$ 29,922	$ 11,102	$ 146	$ 143,045	$ 12,713	$ 167,006	$ 5.58	$ 4.78
164	KALB-DT	2013	$ 53,139	$ 7,460	$ 147	$ 253,795	$ 28,927	$ 290,329	$ 5.46	$ 4.78

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				Com	Dev	PS	JSC	Total		
165	WXIN-DT	2010	$ 24,904	$ 32,436	$ -	$ 118,783	$ 29,383	$ 180,601	$ 7.25	$ 4.77
166	WVII-DT	2013	$ 26,200	$ 8,766	$ 156	$ 124,780	$ 12,217	$ 145,920	$ 5.57	$ 4.76
167	WRC-DT	2010	$ 34,792	$ 36,654	$ 84	$ 165,588	$ 28,681	$ 231,008	$ 6.64	$ 4.76
168	WKTV-DT	2013	$ 31,463	$ 15,825	$ 37	$ 149,612	$ 14,305	$ 179,779	$ 5.71	$ 4.76
169	WTHR-DT	2013	$ 52,805	$ 36,750	$ 116	$ 250,204	$ 24,290	$ 311,360	$ 5.90	$ 4.74
170	WBNX-DT	2011	$ 27,039	$ 7	$ 767	$ 127,984	$ -	$ 128,758	$ 4.76	$ 4.73
171	KNTV-DT	2011	$ 79,902	$ 59,663	$ 105	$ 377,835	$ 48,978	$ 486,581	$ 6.09	$ 4.73
172	WMC-DT	2012	$ 77,419	$ 61,980	$ 251	$ 365,146	$ 43,974	$ 471,351	$ 6.09	$ 4.72
173	WJTV-DT	2013	$ 14,751	$ 8,680	$ 59	$ 69,385	$ 10,556	$ 88,679	$ 6.01	$ 4.70
174	WAPT-DT	2012	$ 14,240	$ 10,681	$ 142	$ 66,977	$ 7,212	$ 85,012	$ 5.97	$ 4.70
175	WDTV-DT	2012	$ 12,344	$ 6,590	$ 16	$ 58,022	$ 7,754	$ 72,382	$ 5.86	$ 4.70
176	WHEC-DT	2013	$ 41,899	$ 25,216	$ 114	$ 196,626	$ 19,349	$ 241,305	$ 5.76	$ 4.69
177	WRC-DT	2012	$ 90,079	$ 79,816	$ 125	$ 421,967	$ 48,463	$ 550,371	$ 6.11	$ 4.68
178	WLBT-DT	2013	$ 14,751	$ 10,698	$ 86	$ 69,026	$ 6,913	$ 86,723	$ 5.88	$ 4.68
179	WJRT-DT	2012	$ 7,733	$ 7,197	$ 18	$ 36,054	$ 4,504	$ 47,774	$ 6.18	$ 4.66
180	KARE-DT	2013	$ 33,779	$ 24,795	$ 159	$ 157,468	$ 15,994	$ 198,416	$ 5.87	$ 4.66
181	WJHG-DT	2013	$ 27,151	$ 15,547	$ 154	$ 126,383	$ 5,887	$ 147,971	$ 5.45	$ 4.65
182	KOLN-DT	2013	$ 8,575	$ 5,955	$ 11	$ 39,866	$ 4,269	$ 50,101	$ 5.84	$ 4.65
183	KNTV-DT	2010	$ 117,602	$ 67,016	$ 79	$ 544,622	$ 76,899	$ 688,616	$ 5.86	$ 4.63
184	KSHB-DT	2012	$ 87,257	$ 64,008	$ 96	$ 403,852	$ 43,604	$ 511,560	$ 5.86	$ 4.63
185	WPSD-DT	2013	$ 67,607	$ 39,357	$ 284	$ 312,569	$ 29,511	$ 381,722	$ 5.65	$ 4.62
186	WBNG-DT	2012	$ 22,053	$ 12,246	$ 101	$ 101,364	$ 15,815	$ 129,527	$ 5.87	$ 4.60
187	WAPT-DT	2013	$ 14,751	$ 9,475	$ 118	$ 67,666	$ 6,514	$ 83,773	$ 5.68	$ 4.59
188	WRC-DT	2011	$ 74,280	$ 76,263	$ 171	$ 340,733	$ 49,865	$ 467,032	$ 6.29	$ 4.59
189	WBNS-DT	2013	$ 28,329	$ 19,467	$ 27	$ 129,861	$ 17,597	$ 166,952	$ 5.89	$ 4.58
190	KNTV-DT	2013	$ 60,113	$ 40,892	$ 100	$ 275,328	$ 29,785	$ 346,106	$ 5.76	$ 4.58
191	WTTV-DT	2011	$ 25,640	$ 3,908	$ 63	$ 117,286	$ 1,000	$ 122,257	$ 4.77	$ 4.57
192	WVLA-DT	2012	$ 127,949	$ 62,231	$ 1,096	$ 581,596	$ 78,312	$ 723,235	$ 5.65	$ 4.55
193	WLBT-DT	2012	$ 134,283	$ 89,268	$ 440	$ 608,358	$ 45,468	$ 743,534	$ 5.54	$ 4.53
194	KMSP-DT	2010	$ 20,106	$ 35,244	$ 355	$ 91,036	$ 21,301	$ 147,937	$ 7.36	$ 4.53
195	WDSU-DT	2012	$ 44,616	$ 31,601	$ 39	$ 201,697	$ 17,450	$ 250,787	$ 5.62	$ 4.52
196	WCHS-DT	2012	$ 9,605	$ 4,611	$ 105	$ 43,400	$ 6,147	$ 54,263	$ 5.65	$ 4.52
197	WSMV-DT	2012	$ 12,183	$ 13,180	$ 43	$ 54,978	$ 4,875	$ 73,075	$ 6.00	$ 4.51

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				Com	Dev	PS	JSC	Total		
198	WGBC-DT	2011	$ 52,390	$ 5,563	$ 4	$ 235,650	$ 47,910	$ 289,126	$ 5.52	$ 4.50
199	KFXF-DT	2012	$ 14,741	$ 467	$ 157	$ 66,259	$ 10,396	$ 77,278	$ 5.24	$ 4.49
200	KFVS-DT	2013	$ 29,235	$ 10,240	$ 70	$ 131,326	$ 17,129	$ 158,765	$ 5.43	$ 4.49
201	WBNS-DT	2012	$ 35,795	$ 25,253	$ 2	$ 160,316	$ 24,690	$ 210,261	$ 5.87	$ 4.48
202	WUSA-DT	2011	$ 74,280	$ 57,697	$ 251	$ 332,519	$ 58,850	$ 449,317	$ 6.05	$ 4.48
203	WBNG-DT	2013	$ 16,635	$ 8,951	$ 24	$ 74,395	$ 8,746	$ 92,115	$ 5.54	$ 4.47
204	KLAX-DT	2012	$ 41,315	$ 10,929	$ 78	$ 183,996	$ 19,528	$ 214,532	$ 5.19	$ 4.45
205	WJRT-DT	2013	$ 5,364	$ 4,467	$ 20	$ 23,887	$ 1,816	$ 30,190	$ 5.63	$ 4.45
206	WCHS-DT	2013	$ 21,167	$ 9,558	$ 62	$ 94,179	$ 9,685	$ 113,483	$ 5.36	$ 4.45
207	KEVN-DT	2012	$ 1,288	$ 1,024	$ 7	$ 5,724	$ 1,262	$ 8,017	$ 6.22	$ 4.44
208	WWHO-DT	2012	$ 16,563	$ 580	$ 300	$ 73,212	$ 1,180	$ 75,271	$ 4.54	$ 4.42
209	WHBQ-DT	2010	$ 13,200	$ 19,027	$ 385	$ 58,153	$ 18,249	$ 95,814	$ 7.26	$ 4.41
210	KFVS-DT	2012	$ 30,045	$ 10,857	$ 65	$ 132,039	$ 24,193	$ 167,155	$ 5.56	$ 4.39
211	WCAX-DT	2012	$ 32,510	$ 20,042	$ 54	$ 142,651	$ 21,960	$ 184,707	$ 5.68	$ 4.39
212	KLAX-DT	2013	$ 53,139	$ 13,256	$ 245	$ 233,025	$ 22,324	$ 268,851	$ 5.06	$ 4.39
213	KBMT-DT	2012	$ 2,258	$ 1,259	$ 28	$ 9,891	$ 629	$ 11,806	$ 5.23	$ 4.38
214	WWL-DT	2011	$ 72,281	$ 65,476	$ 18	$ 316,630	$ 52,684	$ 434,809	$ 6.02	$ 4.38
215	WCAX-DT	2013	$ 33,998	$ 20,128	$ 68	$ 148,892	$ 21,103	$ 190,192	$ 5.59	$ 4.38
216	KEYT-DT	2011	$ 27,466	$ 15,757	$ 55	$ 120,118	$ 5,718	$ 141,648	$ 5.16	$ 4.37
217	WCWJ-DT	2011	$ 1,427	$ 699	$ 343	$ 6,219	$ 1,500	$ 8,762	$ 6.14	$ 4.36
218	WTTE-DT	2011	$ 22,477	$ 19,298	$ 298	$ 97,862	$ 28,070	$ 145,528	$ 6.47	$ 4.35
219	WCAU-DT	2013	$ 88,728	$ 73,046	$ 110	$ 384,918	$ 38,875	$ 496,949	$ 5.60	$ 4.34
220	WDVM-DT	2013	$ 33,286	$ 23,981	$ 7,167	$ 143,583	$ 16,612	$ 191,344	$ 5.75	$ 4.31
221	WVLA-DT	2013	$ 265,342	$ 117,688	$ 858	$ 1,143,159	$ 106,876	$ 1,368,580	$ 5.16	$ 4.31
222	KHGI-DT	2012	$ 11,293	$ 8,356	$ 34	$ 48,243	$ 5,895	$ 62,528	$ 5.54	$ 4.27
223	WTVH-DT	2012	$ 29,114	$ 15,336	$ 60	$ 123,945	$ 20,779	$ 160,119	$ 5.50	$ 4.26
224	WVNY-DT	2013	$ 33,998	$ 14,707	$ 746	$ 144,010	$ 14,997	$ 174,459	$ 5.13	$ 4.24
225	WWHO-DT	2013	$ 19,603	$ 755	$ 120	$ 82,889	$ 1,228	$ 84,992	$ 4.34	$ 4.23
226	WTOK-DT	2012	$ 31,755	$ 15,077	$ 406	$ 133,701	$ 13,948	$ 163,131	$ 5.14	$ 4.21
227	WRC-DT	2013	$ 100,329	$ 91,490	$ 154	$ 422,311	$ 45,907	$ 559,861	$ 5.58	$ 4.21
228	KPIX-DT	2011	$ 87,276	$ 72,830	$ 89	$ 367,228	$ 56,054	$ 496,201	$ 5.69	$ 4.21
229	KTMF-DT	2012	$ 5,686	$ 695	$ 420	$ 23,887	$ 4,462	$ 29,464	$ 5.18	$ 4.20
230	KFDM-DT	2012	$ 2,258	$ 1,623	$ 453	$ 9,479	$ 1,881	$ 13,436	$ 5.95	$ 4.20

	Station	Year	Actual Royalties	Gray Model 1 Royalty Allocation					Gray Royalty Allocation /Actual Royalties	Gray PS Royalty Allocation /Actual Royalties
				Com	Dev	PS	JSC	Total		
231	KSHB-DT	2013	$ 76,674	$ 61,965	$ 189	$ 321,154	$ 34,849	$ 418,158	$ 5.45	$ 4.19
232	WVNY-DT	2012	$ 32,510	$ 15,841	$ 581	$ 135,181	$ 17,359	$ 168,961	$ 5.20	$ 4.16
233	WUSA-DT	2013	$ 17,221	$ 12,230	$ 14	$ 71,572	$ 12,359	$ 96,175	$ 5.58	$ 4.16
234	WGBC-DT	2012	$ 10,364	$ 94	$ -	$ 43,047	$ 6,418	$ 49,559	$ 4.78	$ 4.15
235	WICS-DT	2011	$ 89,442	$ 50,677	$ 620	$ 370,705	$ 27,862	$ 449,865	$ 5.03	$ 4.14
236	WMC-DT	2013	$ 108,279	$ 81,111	$ 177	$ 448,375	$ 48,673	$ 578,337	$ 5.34	$ 4.14
237	KHGI-DT	2013	$ 5,376	$ 3,456	$ 22	$ 22,204	$ 1,296	$ 26,978	$ 5.02	$ 4.13
238	WTVY-DT	2012	$ 85,546	$ 46,764	$ 329	$ 353,208	$ 45,475	$ 445,776	$ 5.21	$ 4.13
239	WTVH-DT	2013	$ 46,834	$ 21,112	$ 75	$ 192,876	$ 29,463	$ 243,526	$ 5.20	$ 4.12
240	WBDT-DT	2011	$ 33,264	$ 8,599	$ 239	$ 136,424	$ 3,905	$ 149,166	$ 4.48	$ 4.10
241	KEYT-DT	2010	$ 18,370	$ 9,947	$ 32	$ 75,268	$ 11,981	$ 97,227	$ 5.29	$ 4.10
242	KPIX-DT	2013	$ 65,197	$ 46,103	$ 85	$ 266,666	$ 34,372	$ 347,227	$ 5.33	$ 4.09
243	KCTV-DT	2012	$ 38,133	$ 32,646	$ 5	$ 155,950	$ 24,381	$ 212,982	$ 5.59	$ 4.09
244	KFXF-DT	2013	$ 905	$ 26	$ 3	$ 3,698	$ 510	$ 4,237	$ 4.68	$ 4.09
245	WLBT-DT	2010	$ 180,200	$ 105,414	$ 2,561	$ 735,867	$ 87,409	$ 931,251	$ 5.17	$ 4.08
246	KCTV-DT	2013	$ 45,274	$ 35,748	$ -	$ 184,624	$ 25,856	$ 246,228	$ 5.44	$ 4.08
247	KPIX-DT	2010	$ 130,551	$ 85,787	$ 334	$ 531,889	$ 85,530	$ 703,540	$ 5.39	$ 4.07
248	WSYX-DT	2012	$ 42,186	$ 25,969	$ 110	$ 171,732	$ 21,862	$ 219,674	$ 5.21	$ 4.07
249	WMUR-DT	2013	$ 83,668	$ 49,789	$ 597	$ 340,053	$ 38,633	$ 429,071	$ 5.13	$ 4.06
250	WSYX-DT	2013	$ 47,932	$ 29,844	$ 175	$ 194,798	$ 22,067	$ 246,884	$ 5.15	$ 4.06
251	WGNO-DT	2012	$ 23,520	$ 13,507	$ 111	$ 94,619	$ 7,122	$ 115,358	$ 4.90	$ 4.02
252	KGO-DT	2013	$ 78,653	$ 68,837	$ 216	$ 315,945	$ 28,125	$ 413,123	$ 5.25	$ 4.02
253	WUSA-DT	2012	$ 74,681	$ 51,096	$ 154	$ 299,766	$ 44,068	$ 395,084	$ 5.29	$ 4.01
254	KNBC-DT	2013	$ 714,225	$ 426,698	$ 1,345	$ 2,865,161	$ 235,708	$ 3,528,913	$ 4.94	$ 4.01
255	KNBC-DT	2012	$ 812,007	$ 413,659	$ 967	$ 3,256,776	$ 268,276	$ 3,939,678	$ 4.85	$ 4.01
256	WNAB-DT	2012	$ 12,183	$ 1,576	$ 314	$ 48,800	$ -	$ 50,689	$ 4.16	$ 4.01
257	W21AU	2010	$ 490,430	$ -	$ 241	$ 1,958,394	$ 176,779	$ 2,135,414	$ 4.35	$ 3.99
258	WBNX-DT	2012	$ 43,052	$ 60	$ 928	$ 171,100	$ -	$ 172,088	$ 4.00	$ 3.97
259	WLBT-DT	2011	$ 187,804	$ 126,790	$ 986	$ 743,421	$ 93,817	$ 965,014	$ 5.14	$ 3.96
260	WRTV-DT	2013	$ 52,805	$ 37,165	$ 185	$ 208,774	$ 24,964	$ 271,088	$ 5.13	$ 3.95
261	WTTV-DT	2012	$ 28,641	$ 5,197	$ 32	$ 112,871	$ 97	$ 118,197	$ 4.13	$ 3.94
262	WRTV-DT	2012	$ 47,495	$ 35,467	$ 289	$ 185,851	$ 23,286	$ 244,893	$ 5.16	$ 3.91
263	WMUR-DT	2012	$ 57,545	$ 41,080	$ 161	$ 224,775	$ 33,040	$ 299,055	$ 5.20	$ 3.91

	Station	Year	Actual Royalties	Gray Model 1 Royalty Allocation					Gray Royalty Allocation /Actual Royalties	Gray PS Royalty Allocation /Actual Royalties
				Com	Dev	PS	JSC	Total		
264	WREG-DT	2013	$ 54,991	$ 47,088	$ 289	$ 214,793	$ 30,289	$ 292,459	$ 5.32	$ 3.91
265	WNBC-DT	2013	$ 1,073,403	$ 660,908	$ 1,425	$ 4,177,034	$ 420,500	$ 5,259,866	$ 4.90	$ 3.89
266	WNBC-DT	2012	$ 1,124,494	$ 641,014	$ 861	$ 4,351,891	$ 459,971	$ 5,453,736	$ 4.85	$ 3.87
267	KGO-DT	2011	$ 227,409	$ 166,484	$ 227	$ 877,440	$ 80,447	$ 1,124,598	$ 4.95	$ 3.86
268	WNOL-DT	2011	$ 59,958	$ 535	$ 1,039	$ 231,283	$ 4,921	$ 237,778	$ 3.97	$ 3.86
269	WREG-DT	2012	$ 50,932	$ 48,749	$ 241	$ 194,995	$ 30,038	$ 274,023	$ 5.38	$ 3.83
270	KSAT-DT	2013	$ 55,885	$ 51,312	$ 236	$ 213,439	$ 25,350	$ 290,338	$ 5.20	$ 3.82
271	KBSI-DT	2012	$ 21,845	$ 8,453	$ 2,648	$ 83,043	$ 19,236	$ 113,380	$ 5.19	$ 3.80
272	KPIX-DT	2012	$ 73,991	$ 52,965	$ 92	$ 280,095	$ 40,806	$ 373,958	$ 5.05	$ 3.79
273	KSTP-DT	2012	$ 31,030	$ 32,583	$ 52	$ 117,268	$ 14,843	$ 164,747	$ 5.31	$ 3.78
274	KSAT-DT	2012	$ 52,918	$ 48,730	$ 270	$ 199,945	$ 24,880	$ 273,825	$ 5.17	$ 3.78
275	WBDT-DT	2012	$ 51,768	$ 9,918	$ 289	$ 194,774	$ 3,928	$ 208,909	$ 4.04	$ 3.76
276	WFFF-DT	2011	$ 28,090	$ 20,146	$ 471	$ 105,591	$ 30,730	$ 156,938	$ 5.59	$ 3.76
277	WWL-DT	2012	$ 29,051	$ 23,231	$ -	$ 109,203	$ 28,723	$ 161,156	$ 5.55	$ 3.76
278	KSKN-DT	2010	$ 102,437	$ 16,278	$ 169	$ 382,249	$ 2,449	$ 401,145	$ 3.92	$ 3.73
279	WICS-DT	2010	$ 22,757	$ 11,017	$ 408	$ 84,907	$ 17,581	$ 113,913	$ 5.01	$ 3.73
280	WTTE-DT	2012	$ 25,623	$ 17,956	$ 281	$ 95,211	$ 23,810	$ 137,258	$ 5.36	$ 3.72
281	WNOL-DT	2012	$ 62,536	$ 844	$ 859	$ 232,202	$ 4,844	$ 238,748	$ 3.82	$ 3.71
282	KSTP-DT	2013	$ 33,779	$ 34,131	$ 243	$ 125,178	$ 14,387	$ 173,938	$ 5.15	$ 3.71
283	WTIC-DT	2010	$ 92,115	$ 74,012	$ 441	$ 340,793	$ 77,628	$ 492,874	$ 5.35	$ 3.70
284	KGO-DT	2012	$ 93,018	$ 84,555	$ 274	$ 342,524	$ 34,098	$ 461,451	$ 4.96	$ 3.68
285	WLMT-DT	2012	$ 44,949	$ 22,460	$ 1,095	$ 164,264	$ 5,832	$ 193,651	$ 4.31	$ 3.65
286	KEVN-DT	2013	$ 1,491	$ 868	$ 3	$ 5,439	$ 1,004	$ 7,313	$ 4.90	$ 3.65
287	WBNX-DT	2013	$ 54,259	$ 108	$ 533	$ 197,582	$ -	$ 198,223	$ 3.65	$ 3.64
288	WNOL-DT	2013	$ 75,247	$ 5,328	$ 413	$ 273,973	$ 5,862	$ 285,576	$ 3.80	$ 3.64
289	KCBS-DT	2013	$ 732,097	$ 411,936	$ 849	$ 2,659,867	$ 335,158	$ 3,407,810	$ 4.65	$ 3.63
290	WDAF-DT	2011	$ 18,490	$ 38,451	$ -	$ 66,599	$ 21,964	$ 127,013	$ 6.87	$ 3.60
291	KMSP-DT	2011	$ 19,081	$ 37,024	$ 169	$ 68,352	$ 16,844	$ 122,389	$ 6.41	$ 3.58
292	WCBS-DT	2013	$ 1,159,483	$ 599,749	$ 1,946	$ 4,139,340	$ 600,374	$ 5,341,408	$ 4.61	$ 3.57
293	WLMT-DT	2013	$ 69,262	$ 26,905	$ 634	$ 246,727	$ 11,913	$ 286,180	$ 4.13	$ 3.56
294	KBSI-DT	2013	$ 29,235	$ 8,461	$ 3,777	$ 104,069	$ 18,908	$ 135,215	$ 4.63	$ 3.56
295	WABC-DT	2013	$ 1,125,189	$ 780,619	$ 6,003	$ 4,005,030	$ 409,134	$ 5,200,786	$ 4.62	$ 3.56
296	WXIN-DT	2011	$ 39,454	$ 61,421	$ -	$ 139,826	$ 41,400	$ 242,647	$ 6.15	$ 3.54

	Station	Year	Actual Royalties	Gray Model 1 Royalty Allocation					Gray Royalty Allocation /Actual Royalties	Gray PS Royalty Allocation /Actual Royalties
				Com	Dev	PS	JSC	Total		
297	KXVO-DT	2013	$ 157,534	$ 16,750	$ 723	$ 556,303	$ 7,022	$ 580,798	$ 3.69	$ 3.53
298	WTTV-DT	2013	$ 30,992	$ 1,880	$ -	$ 109,359	$ -	$ 111,239	$ 3.59	$ 3.53
299	KABC-DT	2013	$ 773,201	$ 634,836	$ 1,949	$ 2,724,619	$ 242,929	$ 3,604,334	$ 4.66	$ 3.52
300	KRNS-CD	2013	$ 56,155	$ 1,430	$ 989	$ 196,848	$ -	$ 199,266	$ 3.55	$ 3.51
301	KMAX-DT	2010	$ 127,171	$ 61,989	$ -	$ 440,107	$ 30,036	$ 532,131	$ 4.18	$ 3.46
302	WLFL-DT	2013	$ 84,482	$ 18,123	$ 1,409	$ 292,216	$ 350	$ 312,098	$ 3.69	$ 3.46
303	KGO-DT	2010	$ 317,884	$ 159,621	$ 185	$ 1,098,566	$ 130,605	$ 1,388,977	$ 4.37	$ 3.46
304	WTHR-DT	2010	$ 472,720	$ 213,393	$ 346	$ 1,620,313	$ 176,226	$ 2,010,279	$ 4.25	$ 3.43
305	WLFL-DT	2012	$ 101,859	$ 23,967	$ 4,252	$ 345,437	$ -	$ 373,656	$ 3.67	$ 3.39
306	WTTE-DT	2013	$ 28,329	$ 19,660	$ 100	$ 95,916	$ 19,364	$ 135,040	$ 4.77	$ 3.39
307	WFFF-DT	2012	$ 32,475	$ 18,114	$ 436	$ 109,891	$ 29,065	$ 157,507	$ 4.85	$ 3.38
308	WLFL-DT	2011	$ 59,926	$ 16,955	$ 2,127	$ 201,992	$ -	$ 221,074	$ 3.69	$ 3.37
309	WPCW-DT	2010	$ 119,426	$ 63,867	$ 6,179	$ 397,459	$ 10,263	$ 477,769	$ 4.00	$ 3.33
310	KXVO-DT	2012	$ 133,523	$ 18,508	$ 2,634	$ 439,078	$ 6,012	$ 466,233	$ 3.49	$ 3.29
311	KTVU-DT	2010	$ 155,869	$ 122,499	$ 1,464	$ 508,376	$ 72,351	$ 704,690	$ 4.52	$ 3.26
312	WTIC-DT	2012	$ 2,558	$ 3,023	$ 3	$ 8,332	$ 2,491	$ 13,849	$ 5.41	$ 3.26
313	WSFL-DT	2013	$ 377,948	$ 4,546	$ 261	$ 1,230,012	$ 37,465	$ 1,272,283	$ 3.37	$ 3.25
314	KCBS-DT	2012	$ 798,920	$ 401,771	$ 178	$ 2,584,012	$ 332,098	$ 3,318,059	$ 4.15	$ 3.23
315	KXVO-DT	2011	$ 105,166	$ 9,514	$ 7,806	$ 339,355	$ 9,350	$ 366,026	$ 3.48	$ 3.23
316	WHBQ-DT	2011	$ 39,184	$ 56,141	$ 388	$ 125,925	$ 36,279	$ 218,734	$ 5.58	$ 3.21
317	WBDT-DT	2013	$ 60,983	$ 25,712	$ 66	$ 195,206	$ 4,574	$ 225,558	$ 3.70	$ 3.20
318	KMAX-DT	2013	$ 77,254	$ 53,093	$ -	$ 246,234	$ 9,263	$ 308,590	$ 3.99	$ 3.19
319	KTVU-DT	2011	$ 100,935	$ 118,915	$ 317	$ 321,345	$ 56,818	$ 497,395	$ 4.93	$ 3.18
320	WCBS-DT	2012	$ 1,220,354	$ 585,859	$ 335	$ 3,826,958	$ 613,015	$ 5,026,167	$ 4.12	$ 3.14
321	KSWB-DT	2010	$ 93,534	$ 59,096	$ 783	$ 292,720	$ 26,993	$ 379,592	$ 4.06	$ 3.13
322	KABC-DT	2012	$ 831,563	$ 602,573	$ 1,879	$ 2,598,008	$ 246,203	$ 3,448,664	$ 4.15	$ 3.12
323	KMAX-DT	2012	$ 90,890	$ 63,417	$ -	$ 283,619	$ 15,606	$ 362,642	$ 3.99	$ 3.12
324	WDAF-DT	2012	$ 14,940	$ 24,336	$ -	$ 46,330	$ 4,418	$ 75,084	$ 5.03	$ 3.10
325	KMAX-DT	2011	$ 107,784	$ 70,529	$ -	$ 333,956	$ 19,367	$ 423,852	$ 3.93	$ 3.10
326	WTIC-DT	2011	$ 91,600	$ 104,963	$ 101	$ 283,522	$ 80,795	$ 469,381	$ 5.12	$ 3.10
327	WABC-DT	2012	$ 1,160,051	$ 735,941	$ 1,358	$ 3,566,491	$ 404,106	$ 4,707,897	$ 4.06	$ 3.07
328	WXIN-DT	2012	$ 47,173	$ 65,835	$ -	$ 142,650	$ 40,979	$ 249,464	$ 5.29	$ 3.02
329	KTVU-DT	2012	$ 85,149	$ 97,820	$ 460	$ 255,671	$ 45,221	$ 399,172	$ 4.69	$ 3.00

	Station	Year	Actual Royalties	Gray Model 1 Royalty Allocation					Gray Royalty Allocation /Actual Royalties	Gray PS Royalty Allocation /Actual Royalties
				Com	Dev	PS	JSC	Total		
330	KNBC-DT	2011	$ 880,373	$ 362,317	$ 1,516	$ 2,635,293	$ 241,795	$ 3,240,921	$ 3.68	$ 2.99
331	WPCW-DT	2013	$ 163,872	$ 88,892	$ 15,278	$ 484,451	$ 7,079	$ 595,699	$ 3.64	$ 2.96
332	KABC-DT	2011	$ 918,406	$ 556,113	$ 896	$ 2,714,944	$ 269,441	$ 3,541,394	$ 3.86	$ 2.96
333	WFFF-DT	2013	$ 33,998	$ 17,347	$ 202	$ 100,273	$ 22,545	$ 140,367	$ 4.13	$ 2.95
334	WSFL-DT	2012	$ 887,844	$ 149,359	$ 1,720	$ 2,592,976	$ 71,335	$ 2,815,390	$ 3.17	$ 2.92
335	WDCW-DT	2013	$ 2,064,642	$ 69,798	$ 14,988	$ 6,022,545	$ 187,602	$ 6,294,933	$ 3.05	$ 2.92
336	KTVU-DT	2013	$ 73,179	$ 79,820	$ 312	$ 213,379	$ 34,101	$ 327,613	$ 4.48	$ 2.92
337	WRTV-DT	2010	$ 472,720	$ 195,936	$ 5,815	$ 1,370,640	$ 214,295	$ 1,786,685	$ 3.78	$ 2.90
338	KWGN-DT	2013	$ 379,567	$ 207,007	$ -	$ 1,091,686	$ -	$ 1,298,692	$ 3.42	$ 2.88
339	WXIN-DT	2013	$ 52,805	$ 66,599	$ 1	$ 151,160	$ 34,155	$ 251,916	$ 4.77	$ 2.86
340	WNUV-DT	2010	$ 143,126	$ 2,423	$ 13,745	$ 406,588	$ 47,169	$ 469,925	$ 3.28	$ 2.84
341	WABC-DT	2011	$ 1,317,846	$ 628,476	$ 1,772	$ 3,707,933	$ 458,006	$ 4,796,186	$ 3.64	$ 2.81
342	KCBS-DT	2011	$ 899,494	$ 389,631	$ 82	$ 2,508,098	$ 351,465	$ 3,249,276	$ 3.61	$ 2.79
343	WNBC-DT	2011	$ 1,232,050	$ 522,183	$ 1,236	$ 3,385,833	$ 453,131	$ 4,362,383	$ 3.54	$ 2.75
344	WHBQ-DT	2012	$ 50,932	$ 61,325	$ 499	$ 139,967	$ 40,047	$ 241,838	$ 4.75	$ 2.75
345	KTTV-DT	2013	$ 860,070	$ 616,770	$ 4,310	$ 2,359,936	$ 367,024	$ 3,348,040	$ 3.89	$ 2.74
346	KNBC-DT	2010	$ 1,102,249	$ 327,541	$ 998	$ 2,984,440	$ 269,640	$ 3,582,620	$ 3.25	$ 2.71
347	WPCW-DT	2012	$ 150,596	$ 84,409	$ 2,116	$ 407,103	$ 32,798	$ 526,427	$ 3.50	$ 2.70
348	KWGN-DT	2012	$ 421,238	$ 225,434	$ -	$ 1,121,396	$ -	$ 1,346,829	$ 3.20	$ 2.66
349	WSBK-DT	2013	$ 360,829	$ 53,804	$ -	$ 948,059	$ 37,634	$ 1,039,497	$ 2.88	$ 2.63
350	WHBQ-DT	2013	$ 54,991	$ 59,678	$ 219	$ 143,972	$ 32,022	$ 235,891	$ 4.29	$ 2.62
351	WSBK-DT	2012	$ 401,469	$ 63,856	$ -	$ 1,048,202	$ 42,695	$ 1,154,753	$ 2.88	$ 2.61
352	XETV-DT	2012	$ 90,639	$ 57,271	$ 12,360	$ 235,151	$ -	$ 304,781	$ 3.36	$ 2.59
353	WDCW-DT	2012	$ 1,637,835	$ 69,697	$ 37,541	$ 4,238,511	$ 216,762	$ 4,562,511	$ 2.79	$ 2.59
354	WCBS-DT	2011	$ 1,288,000	$ 519,065	$ 233	$ 3,313,776	$ 599,231	$ 4,432,305	$ 3.44	$ 2.57
355	KRNS-CD	2012	$ 81,165	$ 1,828	$ 1,165	$ 207,199	$ -	$ 210,192	$ 2.59	$ 2.55
356	WPIX-DT	2013	$ 3,569,531	$ 2,410,278	$ 6,628	$ 9,012,428	$ 449,804	$ 11,879,138	$ 3.33	$ 2.52
357	WNBC-DT	2010	$ 1,463,824	$ 406,138	$ 899	$ 3,691,280	$ 444,651	$ 4,542,968	$ 3.10	$ 2.52
358	KCBS-DT	2010	$ 1,113,602	$ 375,409	$ 391	$ 2,772,364	$ 439,128	$ 3,587,293	$ 3.22	$ 2.49
359	KTLA-DT	2013	$ 805,476	$ 871,369	$ 1,934	$ 1,998,735	$ 29,038	$ 2,901,075	$ 3.60	$ 2.48
360	WWOR-DT	2013	$ 392,127	$ 70,807	$ 54,767	$ 964,321	$ 73,685	$ 1,163,579	$ 2.97	$ 2.46
361	WABC-DT	2010	$ 1,535,023	$ 478,818	$ 603	$ 3,725,257	$ 516,650	$ 4,721,328	$ 3.08	$ 2.43
362	WWOR-DT	2012	$ 441,687	$ 71,374	$ 67,279	$ 1,067,231	$ 101,903	$ 1,307,787	$ 2.96	$ 2.42

	Station	Year	Actual Royalties	Gray Model 1 Royalty Allocation					Gray Royalty Allocation /Actual Royalties	Gray PS Royalty Allocation /Actual Royalties
				Com	Dev	PS	JSC	Total		
363	KABC-DT	2010	$ 1,130,426	$ 541,201	$ 426	$ 2,726,792	$ 340,426	$ 3,608,845	$ 3.19	$ 2.41
364	WNYW-DT	2013	$ 1,204,167	$ 990,724	$ 3,282	$ 2,897,260	$ 640,190	$ 4,531,457	$ 3.76	$ 2.41
365	WWOR-DT	2010	$ 638,116	$ 65,210	$ 73,498	$ 1,504,599	$ 134,477	$ 1,777,785	$ 2.79	$ 2.36
366	KTTV-DT	2012	$ 959,700	$ 824,116	$ 6,350	$ 2,239,066	$ 440,002	$ 3,509,535	$ 3.66	$ 2.33
367	WCBS-DT	2010	$ 1,489,469	$ 352,897	$ 579	$ 3,472,281	$ 667,583	$ 4,493,340	$ 3.02	$ 2.33
368	WNYW-DT	2012	$ 1,292,583	$ 1,025,562	$ 10,580	$ 2,983,684	$ 808,126	$ 4,827,952	$ 3.74	$ 2.31
369	KWGN-DT	2010	$ 607,348	$ 222,186	$ 7,783	$ 1,365,871	$ 60,174	$ 1,656,014	$ 2.73	$ 2.25
370	WNUV-DT	2011	$ 240,714	$ 12,986	$ 17,166	$ 534,693	$ 69,265	$ 634,109	$ 2.63	$ 2.22
371	KWGN-DT	2011	$ 462,962	$ 223,362	$ 2,105	$ 1,023,798	$ 3,484	$ 1,252,748	$ 2.71	$ 2.21
372	WSBK-DT	2010	$ 594,728	$ 96,721	$ -	$ 1,302,745	$ 58,940	$ 1,458,406	$ 2.45	$ 2.19
373	KTLA-DT	2012	$ 972,573	$ 1,055,929	$ 3,378	$ 2,104,784	$ 23,215	$ 3,187,306	$ 3.28	$ 2.16
374	WPIX-DT	2012	$ 3,564,883	$ 2,291,821	$ 6,029	$ 7,655,111	$ 395,402	$ 10,348,363	$ 2.90	$ 2.15
375	WWOR-DT	2011	$ 461,367	$ 75,440	$ 56,359	$ 973,296	$ 116,951	$ 1,222,045	$ 2.65	$ 2.11
376	WDCW-DT	2010	$ 1,687,042	$ 111,230	$ 24,673	$ 3,398,010	$ 122,575	$ 3,656,488	$ 2.17	$ 2.01
377	WSBK-DT	2011	$ 470,468	$ 65,941	$ -	$ 946,511	$ 49,339	$ 1,061,791	$ 2.26	$ 2.01
378	WDCW-DT	2011	$ 1,274,877	$ 83,535	$ 19,116	$ 2,558,515	$ 64,307	$ 2,725,473	$ 2.14	$ 2.01
379	KTTV-DT	2011	$ 1,030,824	$ 713,616	$ 2,640	$ 1,924,895	$ 371,394	$ 3,012,545	$ 2.92	$ 1.87
380	KTTV-DT	2010	$ 1,264,702	$ 558,623	$ 6,674	$ 2,316,670	$ 375,186	$ 3,257,153	$ 2.58	$ 1.83
381	KOFY-DT	2010	$ 861,769	$ 238,743	$ 87,164	$ 1,528,046	$ 43,124	$ 1,897,077	$ 2.20	$ 1.77
382	WSFL-DT	2010	$ 2,620,097	$ 14,268	$ -	$ 4,572,664	$ 218,726	$ 4,805,658	$ 1.83	$ 1.75
383	WNYW-DT	2011	$ 1,466,426	$ 925,386	$ 10,053	$ 2,520,915	$ 693,930	$ 4,150,284	$ 2.83	$ 1.72
384	XETV-DT	2010	$ 820,045	$ 254,891	$ 59,297	$ 1,391,833	$ -	$ 1,706,022	$ 2.08	$ 1.70
385	WNYW-DT	2010	$ 1,732,116	$ 735,953	$ 20,698	$ 2,909,989	$ 688,509	$ 4,355,149	$ 2.51	$ 1.68
386	WSFL-DT	2011	$ 4,644,588	$ 111,869	$ 9,724	$ 7,729,387	$ 324,878	$ 8,175,858	$ 1.76	$ 1.66
387	XETV-DT	2011	$ 1,558,973	$ 691,387	$ 127,256	$ 2,518,841	$ -	$ 3,337,483	$ 2.14	$ 1.62
388	KTLA-DT	2011	$ 1,563,084	$ 1,195,097	$ 4,807	$ 2,423,063	$ 40,561	$ 3,663,528	$ 2.34	$ 1.55
389	KTLA-DT	2010	$ 1,587,772	$ 798,471	$ 14,839	$ 2,451,069	$ 44,877	$ 3,309,256	$ 2.08	$ 1.54
390	WPIX-DT	2011	$ 4,650,103	$ 1,878,647	$ 8,653	$ 6,412,558	$ 469,852	$ 8,769,710	$ 1.89	$ 1.38
391	WPIX-DT	2010	$ 5,112,418	$ 1,299,154	$ 7,232	$ 6,716,400	$ 538,211	$ 8,560,996	$ 1.67	$ 1.31

Appendix G: STATA Manual Excerpt: goodness of fit test

Title

> **poisson postestimation** — Postestimation tools for poisson

Description	Syntax for predict	Menu for predict
Options for predict	Syntax for estat gof	Menu for estat
Remarks and examples	Methods and formulas	Also see

Description

The following postestimation command is of special interest after poisson:

Command	Description
estat gof	goodness-of-fit test

estat gof is not appropriate after the svy prefix.

The following standard postestimation commands are also available:

Command	Description
contrast	contrasts and ANOVA-style joint tests of estimates
estat ic	Akaike's and Schwarz's Bayesian information criteria (AIC and BIC)
estat summarize	summary statistics for the estimation sample
estat vce	variance–covariance matrix of the estimators (VCE)
estat (svy)	postestimation statistics for survey data
estimates	cataloging estimation results
forecast[1]	dynamic forecasts and simulations
lincom	point estimates, standard errors, testing, and inference for linear combinations of coefficients
linktest	link test for model specification
lrtest[2]	likelihood-ratio test
margins	marginal means, predictive margins, marginal effects, and average marginal effects
marginsplot	graph the results from margins (profile plots, interaction plots, etc.)
nlcom	point estimates, standard errors, testing, and inference for nonlinear combinations of coefficients
predict	predictions, residuals, influence statistics, and other diagnostic measures
predictnl	point estimates, standard errors, testing, and inference for generalized predictions
pwcompare	pairwise comparisons of estimates
suest	seemingly unrelated estimation
test	Wald tests of simple and composite linear hypotheses
testnl	Wald tests of nonlinear hypotheses

---

[1] forecast is not appropriate with mi or svy estimation results.

[2] lrtest is not appropriate with svy estimation results.

Special-interest postestimation command

estat gof performs a goodness-of-fit test of the model. Both the deviance statistic and the Pearson statistic are reported. If the tests are significant, the Poisson regression model is inappropriate. Then you could try a negative binomial model; see [R] **nbreg**.

Syntax for predict

> predict [*type*] *newvar* [*if*] [*in*] [, *statistic* <u>nooff</u>set]

statistic	Description
Main	
n	number of events; the default
ir	incidence rate
pr(*n*)	probability $\Pr(y_j = n)$
pr(*a*,*b*)	probability $\Pr(a \le y_j \le b)$
xb	linear prediction
stdp	standard error of the linear prediction
<u>score</u>	first derivative of the log likelihood with respect to $\mathbf{x}_j\boldsymbol{\beta}$

These statistics are available both in and out of sample; type predict ... if e(sample) ... if wanted only for the estimation sample.

Menu for predict

Statistics > Postestimation > Predictions, residuals, etc.

Options for predict

> Main

n, the default, calculates the predicted number of events, which is $\exp(\mathbf{x}_j\boldsymbol{\beta})$ if neither offset() nor exposure() was specified when the model was fit; $\exp(\mathbf{x}_j\boldsymbol{\beta} + \text{offset}_j)$ if offset() was specified; or $\exp(\mathbf{x}_j\boldsymbol{\beta}) \times \text{exposure}_j$ if exposure() was specified.

ir calculates the incidence rate $\exp(\mathbf{x}_j\boldsymbol{\beta})$, which is the predicted number of events when exposure is 1. Specifying ir is equivalent to specifying n when neither offset() nor exposure() was specified when the model was fit.

pr(*n*) calculates the probability $\Pr(y_j = n)$, where *n* is a nonnegative integer that may be specified as a number or a variable.

pr(*a*,*b*) calculates the probability $\Pr(a \le y_j \le b)$, where *a* and *b* are nonnegative integers that may be specified as numbers or variables;

b missing ($b \ge .$) means $+\infty$;
pr(20,.) calculates $\Pr(y_j \ge 20)$;
pr(20,*b*) calculates $\Pr(y_j \ge 20)$ in observations for which $b \ge .$ and calculates $\Pr(20 \le y_j \le b)$ elsewhere.

pr(.,*b*) produces a syntax error. A missing value in an observation of the variable *a* causes a missing value in that observation for pr(*a*,*b*).

xb calculates the linear prediction, which is $x_j\beta$ if neither offset() nor exposure() was specified; $x_j\beta + \text{offset}_j$ if offset() was specified; or $x_j\beta + \ln(\text{exposure}_j)$ if exposure() was specified; see nooffset below.

stdp calculates the standard error of the linear prediction.

score calculates the equation-level score, $\partial\ln L/\partial(x_j\beta)$.

nooffset is relevant only if you specified offset() or exposure() when you fit the model. It modifies the calculations made by predict so that they ignore the offset or exposure variable; the linear prediction is treated as $x_j\beta$ rather than as $x_j\beta + \text{offset}_j$ or $x_j\beta + \ln(\text{exposure}_j)$. Specifying predict ..., nooffset is equivalent to specifying predict ..., ir.

Syntax for estat gof

```
estat gof
```

Menu for estat

Statistics > Postestimation > Reports and statistics

Remarks and examples

▷ Example 1

Continuing with example 2 of [R] **poisson**, we use estat gof to determine whether the model fits the data well.

```
. use http://www.stata-press.com/data/r13/dollhill3
. poisson deaths smokes i.agecat, exp(pyears) irr
(output omitted)
. estat gof
        Deviance goodness-of-fit =   12.13244
        Prob > chi2(4)           =     0.0164

        Pearson goodness-of-fit  =   11.15533
        Prob > chi2(4)           =     0.0249
```

The deviance goodness-of-fit test tells us that, given the model, we can reject the hypothesis that these data are Poisson distributed at the 1.64% significance level. The Pearson goodness-of-fit test tells us that we can reject the hypothesis at the 2.49% significance level.

So let us now back up and be more careful. We can most easily obtain the incidence-rate ratios within age categories by using ir; see [ST] **epitab**:

```
. ir deaths smokes pyears, by(agecat) nohet
```

age category	IRR	[95% Conf. Interval]		M-H Weight	
35–44	5.736638	1.463557	49.40468	1.472169	(exact)
45–54	2.138812	1.173714	4.272545	9.624747	(exact)
55–64	1.46824	.9863624	2.264107	23.34176	(exact)
65–74	1.35606	.9081925	2.096412	23.25315	(exact)
75–84	.9047304	.6000757	1.399687	24.31435	(exact)
Crude	1.719823	1.391992	2.14353		(exact)
M-H combined	1.424682	1.154703	1.757784		

We find that the mortality incidence ratios are greatly different within age category, being highest for the youngest categories and actually dropping below 1 for the oldest. (In the last case, we might argue that those who smoke and who have not died by age 75 are self-selected to be particularly robust.)

Seeing this, we will now parameterize the smoking effects separately for each category, although we will begin by constraining the smoking effects on third and fourth age categories to be equivalent:

```
. constraint 1 smokes#3.agecat = smokes#4.agecat
. poisson deaths c.smokes#agecat i.agecat, exposure(pyears) irr constraints(1)

Iteration 0:   log likelihood =  -31.95424
Iteration 1:   log likelihood = -27.796801
Iteration 2:   log likelihood = -27.574177
Iteration 3:   log likelihood = -27.572645
Iteration 4:   log likelihood = -27.572645
```

Poisson regression				Number of obs	=	10
				Wald chi2(8)	=	632.14
Log likelihood = -27.572645				Prob > chi2	=	0.0000

(1) [deaths]3.agecat#c.smokes - [deaths]4.agecat#c.smokes = 0

deaths	IRR	Std. Err.	z	P>|z|	[95% Conf. Interval]	
agecat# c.smokes						
35–44	5.736637	4.181256	2.40	0.017	1.374811	23.93711
45–54	2.138812	.6520701	2.49	0.013	1.176691	3.887609
55–64	1.412229	.2017485	2.42	0.016	1.067343	1.868557
65–74	1.412229	.2017485	2.42	0.016	1.067343	1.868557
75–84	.9047304	.1855513	-0.49	0.625	.6052658	1.35236
agecat						
45–54	10.5631	8.067701	3.09	0.002	2.364153	47.19623
55–64	47.671	34.37409	5.36	0.000	11.60056	195.8978
65–74	98.22765	70.85012	6.36	0.000	23.89324	403.8244
75–84	199.2099	145.3356	7.26	0.000	47.67693	832.3648
_cons	.0001064	.0000753	-12.94	0.000	.0000266	.0004256
ln(pyears)	1	(exposure)				

```
. estat gof
          Deviance goodness-of-fit =  .0774185
          Prob > chi2(1)          =    0.7808

          Pearson goodness-of-fit  =  .0773882
          Prob > chi2(1)          =    0.7809
```

The goodness-of-fit is now small; we are no longer running roughshod over the data. Let us now consider simplifying the model. The point estimate of the incidence-rate ratio for smoking in age category 1 is much larger than that for smoking in age category 2, but the confidence interval for smokes#1.agecat is similarly wide. Is the difference real?

```
. test smokes#1.agecat = smokes#2.agecat
( 1)  [deaths]1b.agecat#c.smokes - [deaths]2.agecat#c.smokes = 0
          chi2(  1) =      1.56
        Prob > chi2 =    0.2117
```

The point estimates of the incidence-rate ratio for smoking in the 35–44 age category is much larger than that for smoking in the 45–54 age category, but there is insufficient data, and we may be observing random differences. With that success, might we also combine the smokers in the third and fourth categories with those in the first and second categories?

```
. test smokes#2.agecat = smokes#3.agecat, accum
( 1)  [deaths]1b.agecat#c.smokes - [deaths]2.agecat#c.smokes = 0
( 2)  [deaths]2.agecat#c.smokes - [deaths]3.agecat#c.smokes = 0
            chi2( 2) =     4.73
          Prob > chi2 =   0.0938
```

Combining the first four categories may be overdoing it—the 9.38% significance level is enough to stop us, although others may disagree.

Thus we now fit our final model:

```
. constraint 2 smokes#1.agecat = smokes#2.agecat

. poisson deaths c.smokes#agecat i.agecat, exposure(pyears) irr constraints(1/2)

Iteration 0:   log likelihood = -31.550722
Iteration 1:   log likelihood = -28.525057
Iteration 2:   log likelihood = -28.514535
Iteration 3:   log likelihood = -28.514535

Poisson regression                              Number of obs   =         10
                                                Wald chi2(7)    =     642.25
Log likelihood = -28.514535                     Prob > chi2     =     0.0000

( 1)  [deaths]3.agecat#c.smokes - [deaths]4.agecat#c.smokes = 0
( 2)  [deaths]1b.agecat#c.smokes - [deaths]2.agecat#c.smokes = 0
```

deaths	IRR	Std. Err.	z	P>|z|	[95% Conf. Interval]	
agecat# c.smokes						
35–44	2.636259	.7408403	3.45	0.001	1.519791	4.572907
45–54	2.636259	.7408403	3.45	0.001	1.519791	4.572907
55–64	1.412229	.2017485	2.42	0.016	1.067343	1.868557
65–74	1.412229	.2017485	2.42	0.016	1.067343	1.868557
75–84	.9047304	.1855513	-0.49	0.625	.6052658	1.35236
agecat						
45–54	4.294559	.8385329	7.46	0.000	2.928987	6.296797
55–64	23.42263	7.787716	9.49	0.000	12.20738	44.94164
65–74	48.26309	16.06939	11.64	0.000	25.13068	92.68856
75–84	97.87965	34.30881	13.08	0.000	49.24123	194.561
_cons	.0002166	.0000652	-28.03	0.000	.0001201	.0003908
ln(pyears)	1	(exposure)				

The above strikes us as a fair representation of the data. The probabilities of observing the deaths seen in these data are estimated using the following `predict` command:

```
. predict p, pr(0, deaths)
. list deaths p
```

	deaths	p
1.	32	.6891766
2.	104	.4456625
3.	206	.5455328
4.	186	.4910622
5.	102	.5263011
6.	2	.227953
7.	12	.7981917
8.	28	.4772961
9.	28	.6227565
10.	31	.5475718

The probability $\Pr(y \leq \texttt{deaths})$ ranges from 0.23 to 0.80.

◁

Methods and formulas

In the following, we use the same notation as in [R] **poisson**.

The equation-level scores are given by

$$\text{score}(\mathbf{x}\boldsymbol{\beta})_j = y_j - e^{\xi_j}$$

The deviance (D) and Pearson (P) goodness-of-fit statistics are given by

$$\ln L_{\max} = \sum_{j=1}^{n} w_j \left[-y_j \{ \ln(y_j) - 1 \} - \ln(y_j!) \right]$$

$$\chi_D^2 = -2\{ \ln L - \ln L_{\max} \}$$

$$\chi_P^2 = \sum_{j=1}^{n} \frac{w_j (y_j - e^{\xi_j})^2}{e^{\xi_j}}$$

Also see

[R] **poisson** — Poisson regression

[U] **20 Estimation and postestimation commands**

Appendix H: Summary statistics for stations in Gray 2010-13 analysis

Summary statistics for stations in Gray 2010-13 analysis

395		12,081,142			$ 362,779,858	372,830,781,822	2,866,360
year	Station	# records in Gray analysis data	# months with data	Average monthly subscribers	Royalties	Compensible subscriber weighted hours	Compensible subscriberun weighted hours
2010	KABC-DT	37,035	12	376,809	$ 1,130,426	3,299,813,032	8,760
2010	KARE-DT	37,630	12	7,355	$ 22,065	64,471,863	8,760
2010	KARK-DT	18,871	6	2,005	$ 3,008	8,806,501	4,392
2010	KBMT-DT	21,974	7	4,301	$ 7,526	22,119,882	5,137
2010	KCBS-DT	36,895	12	371,201	$ 1,113,602	3,250,678,653	8,760
2010	KCNC-DT	34,336	11	2,684	$ 7,380	21,495,799	8,016
2010	KCTV-DT	21,374	7	2,910	$ 5,093	14,962,690	5,136
2010	KDVR-DT	32,861	11	2,769	$ 7,616	22,177,395	8,016
2010	KEVN-DT	20,651	7	177	$ 310	910,640	5,137
2010	KEYT-DT	6,197	2	36,739	$ 18,370	53,843,767	1,466
2010	KFDM-DT	21,575	7	4,301	$ 7,526	22,116,767	5,136
2010	KFVS-DT	21,403	7	5,269	$ 9,220	27,086,800	5,136
2010	KFXF-DT	26,536	9	3,396	$ 7,642	22,422,935	6,601
2010	KGO-DT	36,867	12	105,962	$ 317,884	927,580,871	8,760
2010	KHOU-DT	22,389	7	1,663	$ 2,910	8,548,229	5,136
2010	KMAX-DT	35,043	12	42,390	$ 127,171	371,331,048	8,760
2010	KMGH-DT	35,100	11	2,659	$ 7,313	21,295,343	8,014
2010	KMSP-DT	37,726	12	6,702	$ 20,106	58,717,395	8,760
2010	KNBC-DT	36,974	12	367,416	$ 1,102,249	3,217,490,001	8,760
2010	KNTV-DT	36,777	12	39,200	$ 117,602	342,963,246	8,760
2010	KOCO-DT	3,122	1	5,982	$ 1,496	4,307,040	720
2010	KOFY-DT	35,040	12	287,256	$ 861,769	2,516,673,117	8,760
2010	KOLN-DT	21,829	7	1,880	$ 3,290	9,663,351	5,136
2010	KOTA-DT	21,914	7	177	$ 310	911,033	5,138
2010	KPIX-DT	37,151	12	43,517	$ 130,551	380,703,538	8,760
2010	KREN-DT	8,832	3	38,273	$ 28,705	84,497,424	2,208
2010	KSAT-DT	38,249	12	10,044	$ 30,132	88,043,502	8,760
2010	KSHB-DT	21,722	7	6,640	$ 11,619	34,132,412	5,136
2010	KSKN-DT	26,208	9	45,528	$ 102,437	298,428,084	6,552
2010	KSTP-DT	38,166	12	7,355	$ 22,065	64,475,869	8,760
2010	KSWB-DT	17,435	6	62,356	$ 93,534	270,852,384	4,344
2010	KTBY-DT	8,669	3	2,744	$ 2,058	5,925,386	2,160
2010	KTFF-DT	11,518	4	206,176	$ 206,176	593,693,628	2,880
2010	KTLA-DT	35,047	12	529,257	$ 1,587,772	4,606,634,328	8,760
2010	KTTV-DT	35,202	12	421,567	$ 1,264,702	3,691,599,057	8,760
2010	KTVD-DT	32,064	11	2,506	$ 6,892	20,074,358	8,016
2010	KTVU-DT	35,190	12	51,956	$ 155,869	454,526,455	8,760
2010	KUSA-DT	34,289	11	2,636	$ 7,250	21,118,133	8,016
2010	KWGN-DT	35,044	12	202,449	$ 607,348	1,770,640,680	8,760

year	Station	# records in Gray analysis data	# months with data	Average monthly subscribers	Royalties	Compensible subscriber weighted hours	Compensible subscriberun weighted hours
2010	W21AU	35,044	12	163,476	$ 490,430	1,431,497,740	8,760
2010	WABC-DT	37,184	12	511,674	$ 1,535,023	4,481,081,774	8,760
2010	WAPT-DT	37,268	12	4,546	$ 13,636	39,818,084	8,760
2010	WBBM-DT	19,137	6	2,045	$ 3,068	9,028,340	4,416
2010	WBDT-DT	5,856	2	9,146	$ 4,573	13,524,912	1,464
2010	WBNG-DT	3,113	1	4,003	$ 1,001	2,978,232	744
2010	WBNS-DT	36,742	12	6,364	$ 19,093	55,770,962	8,760
2010	WBNX-DT	5,856	2	2,512	$ 1,256	3,698,400	1,464
2010	WBOY-DT	21,534	7	3,082	$ 5,394	15,846,512	5,136
2010	WCAU-DT	6,163	2	10,562	$ 5,281	15,647,558	1,464
2010	WCAX-DT	36,993	12	8,463	$ 25,390	74,146,125	8,760
2010	WCBS-DT	37,615	12	496,490	$ 1,489,469	4,348,267,225	8,760
2010	WCWJ-DT	14,691	5	3,810	$ 4,762	13,984,992	3,672
2010	WDAF-DT	20,928	7	2,910	$ 5,093	14,965,141	5,137
2010	WDCW-DT	35,043	12	562,347	$ 1,687,042	4,931,531,690	8,760
2010	WDSU-DT	21,909	7	13,258	$ 23,201	68,169,673	5,136
2010	WDTV-DT	21,611	7	3,082	$ 5,394	15,851,755	5,137
2010	WDVM-DT	21,773	7	2,675	$ 4,682	13,754,838	5,136
2010	WEYI-DT	21,441	7	1,038	$ 1,816	5,334,377	5,136
2010	WFFF-DT	35,232	12	8,472	$ 25,415	74,216,153	8,760
2010	WFLD-DT	17,980	6	2,120	$ 3,180	9,359,147	4,416
2010	WGBC-DT	20,603	7	10,147	$ 17,758	52,171,749	5,137
2010	WGCL-DT	9,335	3	1,195	$ 896	2,577,560	2,160
2010	WGN-DT	35,216	12	22,016,076	$ 66,048,228	30,326,061,922	1,391
2010	WHBQ-DT	20,672	7	7,543	$ 13,200	38,784,964	5,137
2010	WICS-DT	6,338	2	45,514	$ 22,757	66,681,767	1,465
2010	WJHG-DT	6,270	2	19,366	$ 9,683	28,360,805	1,464
2010	WJRT-DT	3,107	1	340	$ 85	244,800	720
2010	WJRT-HD	18,964	6	1,154	$ 1,731	5,092,661	4,418
2010	WJTV-DT	37,974	12	4,546	$ 13,636	39,817,514	8,760
2010	WJXX-DT	15,331	5	3,810	$ 4,762	13,996,830	3,674
2010	WKEF-DT	6,262	2	9,146	$ 4,573	13,556,483	1,466
2010	WKTV-DT	22,086	7	4,154	$ 7,269	21,351,713	5,136
2010	WLBT-DT	36,706	12	60,067	$ 180,200	526,195,713	8,760
2010	WLBZ-DT	21,513	7	3,269	$ 5,721	16,804,249	5,136
2010	WLS-DT	18,882	6	3,075	$ 4,612	13,573,267	4,416
2010	WMAQ-DT	18,944	6	1,856	$ 2,784	8,192,953	4,416
2010	WMC-DT	21,787	7	7,543	$ 13,200	38,779,605	5,136
2010	WMUR-DT	37,826	12	14,301	$ 42,902	125,312,190	8,760
2010	WNBC-DT	36,787	12	487,942	$ 1,463,824	4,273,492,123	8,760
2010	WNNE-DT	36,678	12	8,463	$ 25,390	74,146,442	8,760
2010	WNOL-DT	20,547	7	7,901	$ 13,828	40,635,960	5,136

year	Station	# records in Gray analysis data	# months with data	Average monthly subscribers	Royalties	Compensible subscriber weighted hours	Compensible subscriberun weighted hours
2010	WNUV-DT	17,385	6	95,418	$ 143,126	414,517,872	4,344
2010	WNYW-DT	35,277	12	577,372	$ 1,732,116	5,056,312,846	8,760
2010	WPCW-DT	35,403	12	39,809	$ 119,426	348,811,849	8,760
2010	WPIX-DT	35,044	12	1,704,139	$ 5,112,418	14,830,717,224	8,760
2010	WPLG-DT	34,116	11	399	$ 1,098	3,204,330	8,014
2010	WPSD-DT	21,466	7	5,269	$ 9,220	27,086,700	5,136
2010	WPTZ-DT	12,279	4	422	$ 422	1,241,633	2,928
2010	WRC-DT	21,716	7	19,881	$ 34,792	102,138,894	5,136
2010	WREG-DT	22,070	7	7,543	$ 13,200	38,779,730	5,136
2010	WRTV-DT	37,194	12	157,574	$ 472,720	1,380,682,845	8,760
2010	WSB-DT	9,127	3	1,133	$ 850	2,442,824	2,158
2010	WSBK-DT	35,170	12	198,243	$ 594,728	1,734,228,505	8,760
2010	WSEE-DT	33,337	11	399	$ 1,098	3,204,847	8,016
2010	WSFL-DT	35,060	12	873,366	$ 2,620,097	7,659,450,336	8,760
2010	WSYX-DT	37,834	12	6,364	$ 19,093	55,773,118	8,760
2010	WTHR-DT	36,842	12	157,574	$ 472,720	1,380,661,955	8,760
2010	WTIC-DT	35,254	12	30,705	$ 92,115	268,988,971	8,760
2010	WTOK-DT	21,810	7	10,147	$ 17,758	52,178,506	5,137
2010	WTTE-DT	37,462	12	6,364	$ 19,093	55,771,227	8,760
2010	WTTV-DT	35,043	12	6,743	$ 20,229	59,117,112	8,760
2010	WTVJ-DT	33,615	11	399	$ 1,098	3,204,873	8,016
2010	WTVY-DT	6,061	2	24,604	$ 12,302	36,022,860	1,464
2010	WUSA-DT	21,694	7	19,881	$ 34,792	102,142,389	5,136
2010	WVII-DT	21,239	7	3,269	$ 5,721	16,814,047	5,138
2010	WVLA-DT	6,344	2	16,886	$ 8,443	24,732,009	1,465
2010	WVNY-DT	36,661	12	8,463	$ 25,390	74,148,014	8,760
2010	WWL-DT	22,097	7	13,258	$ 23,201	68,169,767	5,136
2010	WWNY-DT	18,050	6	2,592	$ 3,888	11,386,870	4,392
2010	WWOR-DT	35,982	12	212,705	$ 638,116	1,859,419,827	8,760
2010	WXIA-DT	9,073	3	1,256	$ 942	2,708,962	2,160
2010	WXIN-DT	35,252	12	8,301	$ 24,904	72,851,419	8,760
2010	XETV-DT	18,061	6	546,696	$ 820,045	2,397,790,943	4,416
2011	KABC-DT	36,590	12	306,135	$ 918,406	2,680,558,713	8,760
2011	KALB-DT	12,562	4	7,879	$ 7,879	23,180,439	2,928
2011	KARE-DT	37,726	12	9,035	$ 27,104	79,171,275	8,761
2011	KBMT-DT	37,255	12	7,640	$ 22,920	66,966,439	8,760
2011	KBSI-DT	5,891	2	4,649	$ 2,324	6,834,945	1,465
2011	KCBS-DT	36,859	12	299,831	$ 899,494	2,625,431,970	8,760
2011	KCTV-DT	36,791	12	6,163	$ 18,490	54,086,028	8,761
2011	KEVN-DT	35,329	12	316	$ 949	2,772,358	8,760
2011	KEYT-DT	9,100	3	36,621	$ 27,466	79,020,450	2,158
2011	KFDM-DT	37,046	12	7,640	$ 22,920	66,964,770	8,760

year	Station	# records in Gray analysis data	# months with data	Average monthly subscribers	Royalties	Compensible subscriber weighted hours	Compensible subscriberun weighted hours
2011	KFVS-DT	36,650	12	9,770	$ 29,309	85,665,508	8,759
2011	KFXF-DT	35,226	12	4,490	$ 13,470	39,344,037	8,760
2011	KGO-DT	36,637	12	75,803	$ 227,409	662,978,829	8,760
2011	KHGI-DT	9,218	3	3,691	$ 2,768	8,151,972	2,209
2011	KHOU-DT	34,996	11	2,841	$ 7,814	22,788,675	8,016
2011	KMAX-DT	35,042	12	35,928	$ 107,784	314,591,280	8,760
2011	KMSP-DT	37,700	12	6,360	$ 19,081	55,697,225	8,760
2011	KNBC-DT	37,137	12	293,458	$ 880,373	2,569,616,326	8,760
2011	KNTV-DT	36,882	12	26,634	$ 79,902	233,149,837	8,760
2011	KOLN-DT	37,256	12	3,228	$ 9,684	28,302,992	8,760
2011	KOTA-DT	36,953	12	316	$ 949	2,772,520	8,760
2011	KPIX-DT	37,266	12	29,092	$ 87,276	254,642,425	8,759
2011	KSAT-DT	37,833	12	15,847	$ 47,541	138,846,883	8,760
2011	KSHB-DT	37,295	12	12,751	$ 38,254	111,836,525	8,760
2011	KSTP-DT	37,437	12	9,035	$ 27,104	79,168,389	8,760
2011	KTLA-DT	35,042	12	521,028	$ 1,563,084	4,526,941,392	8,760
2011	KTTV-DT	35,227	12	343,608	$ 1,030,824	3,009,242,959	8,760
2011	KTVU-DT	35,227	12	33,645	$ 100,935	294,489,290	8,760
2011	KWGN-DT	35,582	12	154,321	$ 462,962	1,350,125,283	8,760
2011	KXVO-DT	35,042	12	35,055	$ 105,166	307,216,800	8,760
2011	WABC-DT	36,862	12	439,282	$ 1,317,846	3,846,787,876	8,760
2011	WAPT-DT	37,210	12	4,536	$ 13,606	39,727,584	8,760
2011	WBDT-DT	35,043	12	11,088	$ 33,264	97,304,784	8,760
2011	WBNG-DT	36,761	12	5,600	$ 16,799	49,088,914	8,759
2011	WBNS-DT	37,045	12	8,805	$ 26,415	77,199,499	8,759
2011	WBNX-DT	35,042	12	9,013	$ 27,039	79,062,984	8,760
2011	WBOY-DT	18,225	6	4,722	$ 7,083	20,517,131	4,344
2011	WCAU-DT	36,992	12	15,016	$ 45,046	131,764,871	8,760
2011	WCAX-DT	36,908	12	9,396	$ 28,188	82,325,003	8,760
2011	WCBS-DT	37,508	12	429,333	$ 1,288,000	3,759,578,358	8,759
2011	WCWJ-DT	2,976	1	5,707	$ 1,427	4,246,008	744
2011	WDAF-DT	35,665	12	6,163	$ 18,490	54,084,686	8,760
2011	WDCW-DT	35,042	12	424,959	$ 1,274,877	3,726,098,328	8,760
2011	WDSU-DT	37,351	12	24,094	$ 72,281	211,207,193	8,761
2011	WDTV-DT	36,786	12	5,068	$ 15,202	44,417,099	8,760
2011	WDVM-DT	37,524	12	5,497	$ 16,492	48,216,215	8,760
2011	WEYI-DT	36,680	12	1,824	$ 5,470	15,989,270	8,760
2011	WFFF-DT	35,268	12	9,363	$ 28,090	82,037,549	8,760
2011	WGBC-DT	35,113	12	17,463	$ 52,390	153,057,226	8,760
2011	WGN-DT	35,152	12	22,019,814	$ 66,059,442	25,202,082,896	1,158
2011	WGNO-DT	12,363	4	12,798	$ 12,798	37,607,670	2,930
2011	WHBQ-DT	35,276	12	13,061	$ 39,184	114,493,371	8,760

year	Station	# records in Gray analysis data	# months with data	Average monthly subscribers	Royalties	Compensible subscriber weighted hours	Compensible subscriberun weighted hours
2011	WHEC-DT	12,496	4	5,466	$ 5,466	16,078,431	2,928
2011	WICS-DT	25,129	8	44,721	$ 89,442	260,706,533	5,831
2011	WJHG-DT	37,110	12	19,485	$ 58,454	170,679,059	8,760
2011	WJRT-DT	18,743	6	2,008	$ 3,012	8,871,017	4,418
2011	WJRT-HD	18,538	6	1,639	$ 2,458	7,119,665	4,342
2011	WJTV-DT	38,044	12	4,536	$ 13,606	39,725,561	8,759
2011	WJXX-DT	15,272	5	6,815	$ 8,519	24,563,436	3,622
2011	WKEF-DT	24,757	8	9,556	$ 19,111	55,837,680	5,830
2011	WKTV-DT	37,522	12	7,369	$ 22,107	64,608,484	8,760
2011	WLBT-DT	36,708	12	62,602	$ 187,804	548,399,545	8,759
2011	WLBZ-DT	36,717	12	5,699	$ 17,096	49,960,952	8,760
2011	WLFL-DT	25,902	8	29,963	$ 59,926	176,034,038	5,880
2011	WLMT-DT	8,836	3	5,694	$ 4,270	12,541,152	2,208
2011	WMC-DT	37,199	12	13,061	$ 39,184	114,483,258	8,759
2011	WMUR-DT	37,664	12	14,856	$ 44,567	130,163,136	8,760
2011	WNAB-DT	11,713	4	6,066	$ 6,066	17,818,152	2,928
2011	WNBC-DT	36,839	12	410,683	$ 1,232,050	3,596,514,575	8,760
2011	WNNE-DT	36,759	12	9,396	$ 28,188	82,325,705	8,760
2011	WNOL-DT	35,042	12	19,986	$ 59,958	175,383,432	8,760
2011	WNUV-DT	17,381	6	160,476	$ 240,714	696,889,584	4,344
2011	WNYW-DT	35,267	12	488,809	$ 1,466,426	4,280,045,877	8,760
2011	WPIX-DT	35,044	12	1,550,034	$ 4,650,103	13,481,888,976	8,760
2011	WPSD-DT	36,685	12	9,770	$ 29,309	85,681,828	8,761
2011	WPTZ-DT	36,759	12	1,031	$ 3,093	9,044,781	8,760
2011	WRC-DT	37,126	12	24,760	$ 74,280	216,966,860	8,760
2011	WREG-DT	37,602	12	13,061	$ 39,184	114,491,097	8,760
2011	WRTV-DT	36,870	12	13,151	$ 39,454	115,249,944	8,760
2011	WSBK-DT	35,153	12	156,823	$ 470,468	1,372,020,517	8,760
2011	WSFL-DT	35,059	12	1,548,196	$ 4,644,588	13,465,822,560	8,760
2011	WSMV-DT	12,340	4	6,066	$ 6,066	17,817,254	2,928
2011	WSYX-DT	37,477	12	8,805	$ 26,415	77,219,308	8,760
2011	WTHR-DT	36,787	12	13,151	$ 39,454	115,244,153	8,760
2011	WTIC-DT	35,271	12	30,533	$ 91,600	267,483,574	8,760
2011	WTOK-DT	36,992	12	17,463	$ 52,390	153,059,651	8,760
2011	WTTE-DT	37,427	12	7,492	$ 22,477	65,647,405	8,760
2011	WTTV-DT	35,042	12	8,547	$ 25,640	74,887,851	8,760
2011	WTVF-DT	12,505	4	6,066	$ 6,066	17,817,853	2,928
2011	WTVH-DT	6,246	2	6,430	$ 3,215	9,443,202	1,463
2011	WTVY-DT	36,705	12	26,655	$ 79,964	233,543,871	8,760
2011	WUSA-DT	37,066	12	24,760	$ 74,280	216,966,560	8,760
2011	WVII-DT	36,136	12	5,699	$ 17,096	49,965,300	8,760
2011	WVLA-DT	37,616	12	17,553	$ 52,659	153,775,818	8,760

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2011	WVNY-DT	36,456	12	9,396	$ 28,188	82,326,929	8,760
2011	WWHO-DT	11,713	4	3,938	$ 3,938	11,560,104	2,928
2011	WWL-DT	37,747	12	24,094	$ 72,281	211,190,937	8,760
2011	WWOR-DT	35,498	12	153,789	$ 461,367	1,345,458,131	8,760
2011	WXIN-DT	35,322	12	13,151	$ 39,454	115,246,160	8,760
2011	XETV-DT	35,648	12	519,658	$ 1,558,973	4,514,841,948	8,760
2012	KABC-DT	36,391	12	266,527	$ 831,563	2,340,857,679	8,784
2012	KALB-DT	37,396	12	13,242	$ 41,315	116,349,390	8,784
2012	KARE-DT	37,915	12	9,946	$ 31,030	87,366,288	8,783
2012	KATC-DT	34,741	11	9,071	$ 25,944	72,962,224	8,042
2012	KBMT-DT	3,149	1	8,684	$ 2,258	6,455,686	743
2012	KBSI-DT	35,514	12	7,002	$ 21,845	61,523,007	8,784
2012	KCBS-DT	37,052	12	256,064	$ 798,920	2,249,024,616	8,784
2012	KCTV-DT	37,252	12	12,222	$ 38,133	107,380,161	8,784
2012	KEVN-DT	35,483	12	413	$ 1,288	3,627,119	8,784
2012	KEYC-DT	36,941	12	664	$ 2,071	5,830,749	8,784
2012	KFDM-DT	3,154	1	8,684	$ 2,258	6,461,185	744
2012	KFVS-DT	37,021	12	9,630	$ 30,045	84,483,089	8,784
2012	KFXF-DT	35,482	12	4,725	$ 14,741	41,493,896	8,784
2012	KGO-DT	36,462	12	29,814	$ 93,018	261,796,407	8,784
2012	KHGI-DT	33,705	11	3,949	$ 11,293	31,846,469	8,065
2012	KLAX-DT	36,873	12	13,242	$ 41,315	116,353,260	8,784
2012	KLFY-DT	33,811	11	9,071	$ 25,944	72,941,985	8,040
2012	KMAX-DT	35,138	12	29,132	$ 90,890	255,829,488	8,784
2012	KNBC-DT	37,062	12	260,259	$ 812,007	2,286,334,953	8,784
2012	KNTV-DT	36,902	12	21,823	$ 68,087	191,649,806	8,784
2012	KOLN-DT	37,339	12	3,949	$ 12,321	34,689,344	8,784
2012	KOTA-DT	36,842	12	413	$ 1,288	3,626,803	8,783
2012	KPIX-DT	37,533	12	23,715	$ 73,991	208,278,547	8,785
2012	KRNS-CD	25,705	12	26,014	$ 81,165	162,130,692	6,426
2012	KSAT-DT	37,422	12	16,961	$ 52,918	148,978,720	8,784
2012	KSHB-DT	36,919	12	27,967	$ 87,257	245,348,324	8,784
2012	KSTP-DT	37,639	12	9,946	$ 31,030	87,372,898	8,784
2012	KTLA-DT	35,143	12	311,722	$ 972,573	2,723,759,900	8,786
2012	KTMF-DT	3,039	1	21,870	$ 5,686	15,864,134	725
2012	KTTV-DT	35,446	12	307,596	$ 959,700	2,701,621,479	8,784
2012	KTVU-DT	35,424	12	27,292	$ 85,149	239,660,072	8,784
2012	KWGN-DT	37,905	12	135,012	$ 421,238	1,184,956,536	8,784
2012	KXVO-DT	35,137	12	42,796	$ 133,523	375,960,984	8,784
2012	WABC-DT	36,849	12	371,811	$ 1,160,051	3,265,602,565	8,784
2012	WAPT-DT	37,689	12	4,564	$ 14,240	40,092,740	8,784
2012	WBDT-DT	35,137	12	16,592	$ 51,768	145,770,720	8,784

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2012	WBNG-DT	36,912	12	7,068	$ 22,053	62,101,580	8,785
2012	WBNS-DT	37,052	12	11,473	$ 35,795	100,787,215	8,785
2012	WBNX-DT	35,137	12	13,799	$ 43,052	121,238,520	8,784
2012	WBOY-DT	18,275	6	5,910	$ 9,220	25,820,029	4,369
2012	WCAU-DT	36,958	12	23,173	$ 72,301	203,611,230	8,784
2012	WCAX-DT	37,103	12	10,420	$ 32,510	91,521,448	8,784
2012	WCBS-DT	37,710	12	391,139	$ 1,220,354	3,436,219,383	8,785
2012	WCHS-DT	18,714	6	6,157	$ 9,605	27,200,646	4,418
2012	WDAF-DT	17,744	6	9,577	$ 14,940	41,919,474	4,368
2012	WDCW-DT	35,137	12	524,947	$ 1,637,835	4,612,998,912	8,784
2012	WDSU-DT	18,613	6	28,600	$ 44,616	124,918,215	4,367
2012	WDTV-DT	24,826	8	5,934	$ 12,344	34,748,886	5,855
2012	WDVM-DT	37,437	12	8,573	$ 26,747	75,330,198	8,784
2012	WEYI-DT	36,843	12	2,478	$ 7,733	21,779,410	8,784
2012	WFFF-DT	35,618	12	10,409	$ 32,475	91,424,510	8,784
2012	WGBC-DT	5,783	2	19,930	$ 10,364	28,676,553	1,440
2012	WGN-DT	35,260	12	21,808,275	$ 68,041,818	23,843,645,908	1,109
2012	WGNO-DT	18,467	6	15,077	$ 23,520	65,923,313	4,366
2012	WHBQ-DT	35,503	12	16,324	$ 50,932	143,409,652	8,784
2012	WHEC-DT	37,484	12	10,088	$ 31,476	88,648,207	8,784
2012	WISE-DT	3,016	1	6,325	$ 1,644	4,550,100	719
2012	WJHG-DT	36,740	12	19,944	$ 62,224	175,182,372	8,784
2012	WJRT-DT	37,340	12	2,478	$ 7,733	21,780,735	8,784
2012	WJTV-DT	38,052	12	4,564	$ 14,240	40,095,015	8,785
2012	WKTV-DT	37,238	12	9,129	$ 28,484	80,204,576	8,784
2012	WLBT-DT	36,714	12	43,039	$ 134,283	377,857,563	8,785
2012	WLBZ-DT	36,698	12	7,327	$ 22,860	64,373,648	8,784
2012	WLFL-DT	39,695	12	32,647	$ 101,859	286,764,248	8,784
2012	WLMT-DT	35,137	12	14,407	$ 44,949	126,646,896	8,784
2012	WMC-DT	37,788	12	24,814	$ 77,419	218,222,245	8,784
2012	WMUR-DT	37,823	12	18,444	$ 57,545	162,092,127	8,784
2012	WNAB-DT	14,592	5	9,371	$ 12,183	34,188,168	3,648
2012	WNBC-DT	36,892	12	360,415	$ 1,124,494	3,165,731,573	8,784
2012	WNKY-DT	6,295	2	1,492	$ 776	2,184,092	1,464
2012	WNNE-DT	36,807	12	10,420	$ 32,510	91,520,649	8,784
2012	WNOL-DT	35,138	12	20,044	$ 62,536	176,112,840	8,784
2012	WNYW-DT	35,492	12	414,289	$ 1,292,583	3,638,927,088	8,784
2012	WPCW-DT	35,454	12	48,268	$ 150,596	424,003,248	8,784
2012	WPIX-DT	35,139	12	1,142,591	$ 3,564,883	9,969,990,096	8,784
2012	WPSD-DT	36,593	12	18,077	$ 56,400	158,811,733	8,783
2012	WPTZ-DT	36,807	12	2,083	$ 6,498	18,287,809	8,784
2012	WRC-DT	37,086	12	28,871	$ 90,079	253,625,817	8,784

year	Station	# records in Gray analysis data	# months with data	Average monthly subscribers	Royalties	Compensible subscriber weighted hours	Compensible subscriberun weighted hours
2012	WREG-DT	37,776	12	16,324	$ 50,932	143,409,260	8,784
2012	WRTV-DT	37,047	12	15,223	$ 47,495	133,729,040	8,784
2012	WSBK-DT	35,222	12	128,676	$ 401,469	1,129,272,615	8,784
2012	WSFL-DT	35,142	12	284,565	$ 887,844	2,479,796,640	8,784
2012	WSMV-DT	15,271	5	9,371	$ 12,183	34,189,126	3,648
2012	WSYX-DT	37,898	12	13,521	$ 42,186	118,789,011	8,784
2012	WTHR-DT	36,790	12	14,696	$ 45,850	129,175,703	8,784
2012	WTIC-DT	3,003	1	9,838	$ 2,558	7,314,553	744
2012	WTOK-DT	18,491	6	20,356	$ 31,755	88,895,409	4,367
2012	WTTE-DT	38,048	12	8,213	$ 25,623	72,147,617	8,784
2012	WTTV-DT	35,137	12	9,180	$ 28,641	80,645,856	8,784
2012	WTVH-DT	37,662	12	9,331	$ 29,114	81,997,740	8,785
2012	WTVY-DT	27,734	9	36,558	$ 85,546	240,421,857	6,576
2012	WUSA-DT	37,328	12	23,936	$ 74,681	210,039,439	8,784
2012	WVII-DT	36,485	12	7,327	$ 22,860	64,375,880	8,784
2012	WVLA-DT	36,958	12	41,009	$ 127,949	360,467,189	8,784
2012	WVNY-DT	36,556	12	10,420	$ 32,510	91,520,857	8,784
2012	WWHO-DT	35,137	12	5,309	$ 16,563	46,638,072	8,784
2012	WWL-DT	15,727	5	22,347	$ 29,051	81,368,785	3,648
2012	WWOR-DT	36,517	12	141,566	$ 441,687	1,242,514,925	8,784
2012	WXIN-DT	35,618	12	15,120	$ 47,173	132,835,241	8,784
2012	XETV-DT	14,809	5	69,722	$ 90,639	252,523,884	3,648
2013	KABC-DT	36,537	12	238,642	$ 773,201	2,090,039,128	8,760
2013	KALB-DT	37,141	12	16,401	$ 53,139	143,716,125	8,760
2013	KARE-DT	38,015	12	10,426	$ 33,779	91,341,397	8,760
2013	KATC-DT	38,030	12	9,235	$ 29,922	80,896,775	8,760
2013	KBSI-DT	35,328	12	9,023	$ 29,235	79,074,123	8,760
2013	KCBS-DT	37,006	12	225,956	$ 732,097	1,978,880,139	8,760
2013	KCTV-DT	37,507	12	13,973	$ 45,274	122,422,741	8,761
2013	KEVN-DT	35,414	12	460	$ 1,491	4,032,817	8,760
2013	KEYC-DT	36,903	12	715	$ 2,317	6,266,799	8,760
2013	KFVS-DT	37,079	12	9,023	$ 29,235	79,072,692	8,760
2013	KFXF-DT	5,679	2	1,676	$ 905	2,441,519	1,416
2013	KGO-DT	36,636	12	24,276	$ 78,653	212,542,754	8,760
2013	KHGI-DT	15,317	5	3,982	$ 5,376	14,428,023	3,623
2013	KLAX-DT	37,026	12	16,401	$ 53,139	143,718,600	8,760
2013	KLFY-DT	36,999	12	9,235	$ 29,922	80,897,573	8,760
2013	KMAX-DT	35,041	12	23,844	$ 77,254	208,798,327	8,760
2013	KNBC-DT	37,124	12	220,440	$ 714,225	1,930,581,311	8,760
2013	KNTV-DT	36,883	12	18,553	$ 60,113	162,462,307	8,760
2013	KOLN-DT	24,794	8	3,970	$ 8,575	23,153,297	5,832
2013	KOTA-DT	37,292	12	460	$ 1,491	4,033,284	8,761

year	Station	# records in Gray analysis data	# months with data	Average monthly subscribers	Royalties	Compensible subscriber weighted hours	Compensible subscriberun weighted hours
2013	KPIX-DT	37,503	12	20,123	$ 65,197	176,201,024	8,760
2013	KRNS-CD	35,041	12	17,332	$ 56,155	151,538,664	8,760
2013	KSAT-DT	37,773	12	17,249	$ 55,885	151,106,297	8,760
2013	KSHB-DT	36,846	12	23,665	$ 76,674	207,326,566	8,760
2013	KSTP-DT	37,326	12	10,426	$ 33,779	91,342,155	8,760
2013	KTLA-DT	35,035	12	248,604	$ 805,476	2,166,704,904	8,759
2013	KTTV-DT	35,309	12	265,454	$ 860,070	2,324,704,537	8,760
2013	KTVU-DT	35,317	12	22,586	$ 73,179	197,757,983	8,760
2013	KWGN-DT	37,688	12	117,150	$ 379,567	1,025,425,488	8,760
2013	KXVO-DT	35,041	12	48,622	$ 157,534	426,036,768	8,760
2013	WABC-DT	37,102	12	347,281	$ 1,125,189	3,041,517,185	8,760
2013	WAPT-DT	37,760	12	4,553	$ 14,751	39,880,924	8,760
2013	WBDT-DT	35,041	12	18,822	$ 60,983	164,893,776	8,760
2013	WBNG-DT	24,497	8	7,701	$ 16,635	44,928,998	5,832
2013	WBNS-DT	37,095	12	8,743	$ 28,329	76,602,944	8,760
2013	WBNX-DT	35,041	12	16,747	$ 54,259	146,755,488	8,760
2013	WCAU-DT	36,970	12	27,385	$ 88,728	239,991,103	8,760
2013	WCAX-DT	37,222	12	10,493	$ 33,998	91,924,067	8,760
2013	WCBS-DT	37,573	12	357,865	$ 1,159,483	3,134,385,382	8,760
2013	WCHS-DT	36,978	12	6,533	$ 21,167	57,235,811	8,760
2013	WDCW-DT	35,041	12	637,235	$ 2,064,642	5,583,702,408	8,760
2013	WDVM-DT	37,337	12	10,273	$ 33,286	90,027,565	8,760
2013	WEYI-DT	36,864	12	2,934	$ 9,507	25,717,672	8,760
2013	WFFF-DT	35,347	12	10,493	$ 33,998	91,924,105	8,760
2013	WGN-DT	35,170	12	20,694,528	$ 67,050,270	21,205,841,994	1,038
2013	WHBQ-DT	35,349	12	16,973	$ 54,991	148,666,040	8,760
2013	WHEC-DT	37,580	12	12,932	$ 41,899	113,354,552	8,760
2013	WJHG-DT	15,333	5	20,112	$ 27,151	72,883,323	3,624
2013	WJRT-DT	21,844	7	2,838	$ 5,364	14,446,433	5,086
2013	WJTV-DT	37,654	12	4,553	$ 14,751	39,880,908	8,760
2013	WKTV-DT	37,113	12	9,711	$ 31,463	85,080,646	8,760
2013	WLBT-DT	36,717	12	4,553	$ 14,751	39,878,901	8,760
2013	WLBZ-DT	36,704	12	8,086	$ 26,200	70,855,626	8,760
2013	WLFL-DT	29,618	9	34,766	$ 84,482	227,811,720	6,552
2013	WLMT-DT	35,041	12	21,377	$ 69,262	187,324,104	8,760
2013	WMC-DT	37,880	12	33,420	$ 108,279	292,759,485	8,760
2013	WMUR-DT	38,043	12	25,823	$ 83,668	226,256,583	8,760
2013	WNBC-DT	36,749	12	331,297	$ 1,073,403	2,901,479,421	8,760
2013	WNNE-DT	36,746	12	10,493	$ 33,998	91,923,947	8,760
2013	WNOL-DT	35,043	12	23,224	$ 75,247	203,498,280	8,760
2013	WNYW-DT	35,401	12	371,656	$ 1,204,167	3,254,821,894	8,760
2013	WPCW-DT	35,357	12	50,578	$ 163,872	443,108,102	8,760

year	Station	# records in Gray analysis data	# months with data	Average monthly subscribers	Royalties	Compensible subscriber weighted hours	Compensible subscriberun weighted hours
2013	WPIX-DT	35,042	12	1,101,707	$ 3,569,531	9,593,063,162	8,760
2013	WPSD-DT	36,565	12	20,866	$ 67,607	182,821,502	8,760
2013	WPTZ-DT	36,746	12	2,182	$ 7,069	19,115,457	8,760
2013	WRC-DT	37,096	12	30,966	$ 100,329	271,268,204	8,760
2013	WREG-DT	37,802	12	16,973	$ 54,991	148,666,158	8,760
2013	WRTV-DT	37,265	12	16,298	$ 52,805	142,784,326	8,760
2013	WSBK-DT	35,128	12	111,367	$ 360,829	974,790,336	8,760
2013	WSFL-DT	14,496	5	279,962	$ 377,948	1,005,868,104	3,624
2013	WSYX-DT	37,886	12	14,794	$ 47,932	129,619,908	8,760
2013	WTHR-DT	36,784	12	16,298	$ 52,805	142,782,015	8,760
2013	WTTE-DT	37,541	12	8,743	$ 28,329	76,602,388	8,760
2013	WTTV-DT	35,041	12	9,565	$ 30,992	83,799,816	8,760
2013	WTVH-DT	37,761	12	14,455	$ 46,834	126,739,678	8,760
2013	WUSA-DT	18,484	6	10,630	$ 17,221	46,171,177	4,343
2013	WVII-DT	36,945	12	8,086	$ 26,200	70,856,831	8,760
2013	WVLA-DT	36,992	12	81,896	$ 265,342	717,434,537	8,760
2013	WVNY-DT	36,797	12	10,493	$ 33,998	91,924,363	8,760
2013	WWHO-DT	35,043	12	6,050	$ 19,603	53,014,704	8,760
2013	WWOR-DT	35,911	12	121,027	$ 392,127	1,059,342,724	8,760
2013	WXIN-DT	35,514	12	16,298	$ 52,805	142,782,671	8,760

Appendix I: Details of Gray Alternative Distant Viewing Estimates: Gray Appendix E Total Viewing Regression (Model 4)

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

Output from Dr. Gray's "total" regression

*** 2010 ***

. reg total i.qtr i.program_type

```
      Source |       SS           df       MS      Number of obs   = 2,605,275
-------------+----------------------------------   F(124, 2605150) =   2986.68
       Model | 2.4082e+14        124  1.9421e+12   Prob > F        =    0.0000
    Residual | 1.6940e+15  2,605,150   650245144   R-squared       =    0.1245
-------------+----------------------------------   Adj R-squared   =    0.1244
       Total | 1.9348e+15  2,605,274   742648546   Root MSE        =     25500
```

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------------------------------------------------------------------------------
       total |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         qtr |
           2 |  -2011.529   212.5585    -9.46   0.000    -2428.136   -1594.922
           3 |  -2412.492   195.8526   -12.32   0.000    -2796.357   -2028.628
           4 |  -3876.184   212.4753   -18.24   0.000    -4292.628    -3459.74
           5 |  -4781.306   198.1577   -24.13   0.000    -5169.688   -4392.923
           6 |  -5338.008   213.0133   -25.06   0.000    -5755.507    -4920.51
           7 |  -5554.316   195.2937   -28.44   0.000    -5937.084   -5171.547
           8 |  -6124.626   213.2609   -28.72   0.000     -6542.61   -5706.642
           9 |  -6631.419   194.8079   -34.04   0.000    -7013.235   -6249.602
          10 |  -7457.559   213.9567   -34.86   0.000    -7876.907   -7038.211
          11 |  -7401.285   202.4482   -36.56   0.000    -7798.077   -7004.494
          12 |  -8090.935   214.0579   -37.80   0.000    -8510.481   -7671.389
          13 |  -7805.506   200.3891   -38.95   0.000    -8198.261    -7412.75
          14 |  -8179.963   213.9575   -38.23   0.000    -8599.312   -7760.614
          15 |  -8196.349   208.8392   -39.25   0.000    -8605.667   -7787.032
          16 |   -8327.82   214.4329   -38.84   0.000    -8748.101   -7907.539
          17 |  -8825.367   211.7133   -41.69   0.000    -9240.317   -8410.416
          18 |  -8759.037   214.5341   -40.83   0.000    -9179.517   -8338.558
          19 |  -9262.327   214.2603   -43.23   0.000     -9682.27   -8842.384
          20 |  -8860.024   215.6046   -41.09   0.000    -9282.601   -8437.446
          21 |  -7848.737   216.1332   -36.31   0.000     -8272.35   -7425.123
          22 |   -7014.46   216.3372   -32.42   0.000    -7438.473   -6590.447
          23 |  -6335.845    216.483   -29.27   0.000    -6760.144   -5911.546
          24 |   -5176.66   216.5357   -23.91   0.000    -5601.062   -4752.257
          25 |  -3920.845   216.3645   -18.12   0.000    -4344.912   -3496.779
          26 |  -2724.332   216.3645   -12.59   0.000    -3148.399   -2300.265
          27 |  -1793.527   216.3914    -8.29   0.000    -2217.646   -1369.407
          28 |  -594.6204   216.3801    -2.75   0.006    -1018.718   -170.5231
          29 |   2591.992   214.1212    12.11   0.000     2172.322    3011.662
          30 |   2712.043   214.0967    12.67   0.000     2292.421    3131.665
          31 |   2171.834    214.118    10.14   0.000      1752.17    2591.498
          32 |   1936.772   214.1136     9.05   0.000     1517.117    2356.427
          33 |   1669.956   213.9755     7.80   0.000     1250.571     2089.34
          34 |   1255.026   213.9602     5.87   0.000     835.6716    1674.381
          35 |   730.4967   213.9561     3.41   0.001     311.1503    1149.843
          36 |   829.5295    213.947     3.88   0.000     410.2009    1248.858
          37 |   1741.357   213.9428     8.14   0.000     1322.036    2160.677
          38 |   861.1365   213.8323     4.03   0.000     442.0326     1280.24
          39 |   348.2113   213.9314     1.63   0.104    -71.08671    767.5094
          40 |   513.4869   213.9194     2.40   0.016     94.21233    932.7614
```

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

41	1914.171	214.0303	8.94	0.000	1494.679	2333.663
42	892.6127	214.0333	4.17	0.000	473.1149	1312.111
43	734.0799	214.1424	3.43	0.001	314.3684	1153.791
44	1077.691	214.1381	5.03	0.000	657.9876	1497.394
45	773.2554	214.1384	3.61	0.000	353.5516	1192.959
46	44.39519	214.0635	0.21	0.836	-375.1618	463.9522
47	98.37783	214.3444	0.46	0.646	-321.7296	518.4853
48	695.7173	214.3601	3.25	0.001	275.579	1115.856
49	-1174.732	213.7874	-5.49	0.000	-1593.748	-755.716
50	-1775.51	214.3144	-8.28	0.000	-2195.559	-1355.461
51	-1852.994	214.8764	-8.62	0.000	-2274.144	-1431.844
52	-2018.927	214.8635	-9.40	0.000	-2440.052	-1597.802
53	-972.388	216.7722	-4.49	0.000	-1397.254	-547.5221
54	-1565.741	216.7554	-7.22	0.000	-1990.574	-1140.908
55	-1870.696	216.8326	-8.63	0.000	-2295.68	-1445.712
56	-1708.718	216.8544	-7.88	0.000	-2133.745	-1283.691
57	-1598.422	214.6471	-7.45	0.000	-2019.122	-1177.721
58	-2145.985	214.5924	-10.00	0.000	-2566.579	-1725.392
59	-2259.749	214.6341	-10.53	0.000	-2680.424	-1839.074
60	-1538.598	214.695	-7.17	0.000	-1959.392	-1117.803
61	658.1252	213.6808	3.08	0.002	239.3184	1076.932
62	-118.4646	213.7166	-0.55	0.579	-537.3416	300.4125
63	-251.6697	213.7039	-1.18	0.239	-670.5218	167.1825
64	782.4847	213.6646	3.66	0.000	363.7095	1201.26
65	2261.51	213.2878	10.60	0.000	1843.473	2679.547
66	1749.759	213.3975	8.20	0.000	1331.508	2168.011
67	2221.563	213.2742	10.42	0.000	1803.553	2639.572
68	3599.238	213.3985	16.87	0.000	3180.984	4017.491
69	3680.846	214.3836	17.17	0.000	3260.662	4101.031
70	3305.464	214.4218	15.42	0.000	2885.205	3725.723
71	3351.931	214.5105	15.63	0.000	2931.498	3772.364
72	4149.127	214.5249	19.34	0.000	3728.666	4569.588
73	5544.224	214.8605	25.80	0.000	5123.105	5965.343
74	5266.692	215.0279	24.49	0.000	4845.245	5688.139
75	6165.624	214.2986	28.77	0.000	5745.606	6585.642
76	7312.639	214.1969	34.14	0.000	6892.82	7732.457
77	11972.74	214.313	55.87	0.000	11552.69	12392.78
78	10198.32	214.2636	47.60	0.000	9778.367	10618.27
79	10867.09	214.2078	50.73	0.000	10447.25	11286.93
80	13190.21	214.6614	61.45	0.000	12769.48	13610.94
81	18844.49	216.8975	86.88	0.000	18419.38	19269.6
82	15122.98	217.1053	69.66	0.000	14697.46	15548.49
83	15953.34	216.1294	73.81	0.000	15529.73	16376.95
84	16953.65	217.6373	77.90	0.000	16527.09	17380.21
85	21167.67	214.4978	98.68	0.000	20747.26	21588.07
86	16568.35	216.7719	76.43	0.000	16143.48	16993.21
87	16821.63	215.4556	78.07	0.000	16399.35	17243.92
88	16540.53	217.0008	76.22	0.000	16115.21	16965.84
89	19942.05	210.8891	94.56	0.000	19528.72	20355.39
90	12415.63	213.9767	58.02	0.000	11996.24	12835.01
91	10110.85	202.6904	49.88	0.000	9713.588	10508.12
92	9247.536	213.3975	43.33	0.000	8829.284	9665.787
93	7189.745	209.6839	34.29	0.000	6778.772	7600.718
94	4071.32	212.4663	19.16	0.000	3654.894	4487.747
95	3876.054	192.3608	20.15	0.000	3499.034	4253.075
96	1071.61	212.1024	5.05	0.000	655.8965	1487.323

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

```
       program_type |
    CHILDREN'S SHOW |    807.5847    252.1402     3.20   0.001      313.3987    1301.771
 CHILDREN'S SPECIAL |    1690.201    604.5753     2.80   0.005      505.2543    2875.147
       DAYTIME SOAP |    11120.75    183.6138    60.57   0.000      10760.87    11480.62
            FINANCE |    5886.317    424.3085    13.87   0.000      5054.688    6717.947
FIRST-RUN SYNDICATION |   6637.903    358.6718    18.51   0.000      5934.918    7340.887
          GAME SHOW |    8725.893    183.0563    47.67   0.000      8367.109    9084.677
             HEALTH |    12301.64    376.5321    32.67   0.000      11563.65    13039.63
   HOBBIES & CRAFTS |    3838.969    1891.867     2.03   0.042      130.9762    7546.962
       INSTRUCTIONAL |   6850.805    362.7544    18.89   0.000      6139.819    7561.791
        MINI-SERIES |    7642.042    1591.657     4.80   0.000       4522.45    10761.63
              MOVIE |    3076.838    197.0893    15.61   0.000       2690.55    3463.126
              MUSIC |     28192.6    336.3385    83.82   0.000      27533.39    28851.81
      MUSIC SPECIAL |    11493.66    519.0893    22.14   0.000      10476.27    12511.06
     NETWORK SERIES |    10151.87    178.6414    56.83   0.000      9801.739       10502
               NEWS |    13166.28    163.7988    80.38   0.000      12845.24    13487.32
              OTHER |    4239.884    166.8115    25.42   0.000       3912.94    4566.829
           PELICULA |    9581.511    514.2225    18.63   0.000      8573.653    10589.37
      PLAYOFF SPORTS |   44757.47    266.7187   167.81   0.000      44234.71    45280.23
      PSEUDO-SPORTS |    33879.94    713.9028    47.46   0.000      32480.72    35279.17
      PUBLIC AFFAIRS |   4527.655    316.5483    14.30   0.000      3907.232    5148.079
          RELIGIOUS |    4741.096     233.269    20.32   0.000      4283.897    5198.295
            SPECIAL |     9208.64    244.7138    37.63   0.000       8729.01    9688.271
      SPORTING EVENT |   12758.78    185.1446    68.91   0.000      12395.91    13121.66
    SPORTS ANTHOLOGY |    4135.254    447.6221     9.24   0.000      3257.931    5012.578
     SPORTS-RELATED |    12346.86    214.0748    57.68   0.000      11927.28    12766.44
         SYNDICATED |    7698.441    162.6537    47.33   0.000      7379.646    8017.237
          TALK SHOW |    8119.179    160.0519    50.73   0.000      7805.483    8432.875
       TEAM VS. TEAM |       34588    195.5323   176.89   0.000      34204.77    34971.24
           TV MOVIE |    5152.335    494.0849    10.43   0.000      4183.946    6120.724
                    |
              _cons |    2765.397    213.9011    12.93   0.000      2346.158    3184.636
------------------------------------------------------------------------------------
```

*** 2011 ***

. reg total i.qtr i.program_type

```
      Source |       SS           df       MS      Number of obs   = 2,877,908
-------------+----------------------------------   F(123, 2877784) =   2590.33
       Model |  1.9667e+14         123  1.5990e+12   Prob > F        =    0.0000
    Residual |  1.7764e+15   2,877,784  617281509   R-squared       =    0.0997
-------------+----------------------------------   Adj R-squared   =    0.0996
       Total |  1.9731e+15   2,877,907  685593943   Root MSE        =     24845
```

```
------------------------------------------------------------------------------
       total |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         qtr |
           2 |  -1233.802   199.9763    -6.17   0.000    -1625.749    -841.856
           3 |  -1465.133    183.937    -7.97   0.000    -1825.643   -1104.623
           4 |  -2981.659   199.7801   -14.92   0.000    -3373.221   -2590.097
           5 |  -3613.664   184.6591   -19.57   0.000     -3975.59   -3251.739
           6 |  -4135.546   200.2267   -20.65   0.000    -4527.983   -3743.109
           7 |  -4330.732    183.604   -23.59   0.000    -4690.589   -3970.874
           8 |  -4884.232   200.4077   -24.37   0.000    -5277.024    -4491.44
```

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

9	-4713.926	182.8181	-25.78	0.000	-5072.243	-4355.609
10	-5319.998	200.8816	-26.48	0.000	-5713.719	-4926.277
11	-5561.255	189.2812	-29.38	0.000	-5932.24	-5190.271
12	-6071.321	201.0402	-30.20	0.000	-6465.353	-5677.29
13	-6075.575	189.5582	-32.05	0.000	-6447.102	-5704.047
14	-6820.299	201.2626	-33.89	0.000	-7214.766	-6425.831
15	-6878.845	198.0198	-34.74	0.000	-7266.957	-6490.733
16	-6931.283	201.5526	-34.39	0.000	-7326.319	-6536.247
17	-7411.434	198.8875	-37.26	0.000	-7801.246	-7021.621
18	-7362.204	201.503	-36.54	0.000	-7757.143	-6967.265
19	-7726.836	201.5924	-38.33	0.000	-8121.95	-7331.722
20	-7264.598	202.7101	-35.84	0.000	-7661.903	-6867.294
21	-6271.074	203.2038	-30.86	0.000	-6669.346	-5872.801
22	-5490.605	203.3109	-27.01	0.000	-5889.087	-5092.122
23	-4895.044	203.3732	-24.07	0.000	-5293.648	-4496.44
24	-3685.17	203.3691	-18.12	0.000	-4083.766	-3286.573
25	-2504.605	203.4096	-12.31	0.000	-2903.281	-2105.93
26	-1408.892	203.4226	-6.93	0.000	-1807.594	-1010.191
27	-860.6308	203.4804	-4.23	0.000	-1259.445	-461.8164
28	488.8094	203.4694	2.40	0.016	90.01659	887.6022
29	4700.621	201.3755	23.34	0.000	4305.932	5095.31
30	4982.379	201.3755	24.74	0.000	4587.69	5377.067
31	4645.18	201.3862	23.07	0.000	4250.47	5039.89
32	4482.006	201.3768	22.26	0.000	4087.315	4876.698
33	4587.793	201.3054	22.79	0.000	4193.242	4982.345
34	4366.059	201.3315	21.69	0.000	3971.456	4760.661
35	4037.186	201.2591	20.06	0.000	3642.725	4431.646
36	4103.667	201.246	20.39	0.000	3709.232	4498.102
37	4664.933	201.2458	23.18	0.000	4270.498	5059.367
38	3744.048	201.2231	18.61	0.000	3349.657	4138.438
39	3276.086	201.1951	16.28	0.000	2881.751	3670.421
40	3525.942	201.144	17.53	0.000	3131.706	3920.177
41	5123.284	201.2991	25.45	0.000	4728.745	5517.823
42	3855.662	201.3511	19.15	0.000	3461.021	4250.303
43	3728.55	201.2958	18.52	0.000	3334.018	4123.083
44	4127.605	201.3962	20.49	0.000	3732.876	4522.335
45	3326.242	201.2946	16.52	0.000	2931.712	3720.772
46	2401.257	201.2924	11.93	0.000	2006.731	2795.783
47	2347.553	201.2968	11.66	0.000	1953.019	2742.088
48	2897.857	201.2747	14.40	0.000	2503.366	3292.348
49	897.547	201.0207	4.46	0.000	503.5534	1291.541
50	64.38568	201.4998	0.32	0.749	-330.5469	459.3183
51	34.91497	202.0752	0.17	0.863	-361.1454	430.9753
52	-246.5644	201.9261	-1.22	0.222	-642.3325	149.2037
53	1032.298	202.6699	5.09	0.000	635.0718	1429.524
54	277.3011	202.7539	1.37	0.171	-120.0893	674.6915
55	13.28707	202.8913	0.07	0.948	-384.3728	410.9469
56	99.97953	202.9486	0.49	0.622	-297.7926	497.7517
57	391.192	201.3944	1.94	0.052	-3.533916	785.918
58	-271.4331	201.3992	-1.35	0.178	-666.1684	123.3021
59	-302.3895	201.4376	-1.50	0.133	-697.2001	92.4211
60	373.1819	201.5964	1.85	0.064	-21.93992	768.3037
61	1980.162	200.6841	9.87	0.000	1586.829	2373.496
62	1106.365	200.8117	5.51	0.000	712.7809	1499.948
63	980.2805	200.816	4.88	0.000	586.6883	1373.873
64	1829.921	200.9735	9.11	0.000	1436.02	2223.822
65	2708.349	200.6356	13.50	0.000	2315.11	3101.588

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

66	2372.84	200.7391	11.82	0.000	1979.399	2766.282
67	2929.565	200.748	14.59	0.000	2536.106	3323.024
68	4170.864	200.8351	20.77	0.000	3777.235	4564.494
69	3831.386	201.8598	18.98	0.000	3435.748	4227.024
70	3898.265	202.0828	19.29	0.000	3502.189	4294.34
71	3497.477	202.111	17.30	0.000	3101.346	3893.607
72	4228.77	202.2318	20.91	0.000	3832.403	4625.137
73	6066.101	201.8505	30.05	0.000	5670.481	6461.72
74	6285.391	202.2386	31.08	0.000	5889.011	6681.772
75	7388.793	201.3145	36.70	0.000	6994.223	7783.362
76	8061.793	201.4234	40.02	0.000	7667.01	8456.576
77	11196.15	201.3689	55.60	0.000	10801.48	11590.83
78	9110.944	201.3574	45.25	0.000	8716.291	9505.598
79	9473.548	200.9163	47.15	0.000	9079.759	9867.337
80	11035.4	201.8156	54.68	0.000	10639.85	11430.96
81	16100.74	204.0031	78.92	0.000	15700.9	16500.58
82	12995.4	203.9585	63.72	0.000	12595.65	13395.15
83	13512.17	203.0683	66.54	0.000	13114.17	13910.18
84	13765.91	204.8169	67.21	0.000	13364.47	14167.34
85	18177.32	202.4945	89.77	0.000	17780.43	18574.2
86	13713.67	204.0602	67.20	0.000	13313.72	14113.62
87	14145.43	203.1457	69.63	0.000	13747.27	14543.58
88	13903.76	204.6696	67.93	0.000	13502.62	14304.91
89	17902.26	199.8666	89.57	0.000	17510.53	18294
90	11800.35	201.276	58.63	0.000	11405.85	12194.84
91	9088.92	189.7834	47.89	0.000	8716.951	9460.888
92	8866.933	200.6891	44.18	0.000	8473.59	9260.277
93	6624.938	197.3999	33.56	0.000	6238.042	7011.835
94	3921.649	199.7488	19.63	0.000	3530.149	4313.15
95	4036.038	181.6863	22.21	0.000	3679.939	4392.137
96	1641.343	199.5103	8.23	0.000	1250.309	2032.376
program_type						
CHILDREN'S SHOW	391.7525	227.8101	1.72	0.085	-54.74733	838.2524
CHILDREN'S SPECIAL	4339.765	609.9354	7.12	0.000	3144.313	5535.217
DAYTIME SOAP	12302.9	173.5326	70.90	0.000	11962.78	12643.02
FINANCE	5913.556	344.6214	17.16	0.000	5238.11	6589.002
FIRST-RUN SYNDICATION	4206.22	730.3164	5.76	0.000	2774.826	5637.615
GAME SHOW	9947.746	169.8153	58.58	0.000	9614.914	10280.58
HEALTH	9687.027	337.3813	28.71	0.000	9025.772	10348.28
HOBBIES & CRAFTS	5323.328	3589.357	1.48	0.138	-1711.685	12358.34
INSTRUCTIONAL	7997.567	322.4963	24.80	0.000	7365.486	8629.648
MINI-SERIES	393.364	8785.988	0.04	0.964	-16826.86	17613.59
MOVIE	4341.197	186.376	23.29	0.000	3975.906	4706.487
MUSIC	28136.44	274.867	102.36	0.000	27597.71	28675.17
MUSIC SPECIAL	15095.7	479.1435	31.51	0.000	14156.6	16034.81
NETWORK SERIES	10834.2	166.0662	65.24	0.000	10508.72	11159.69
NEWS	14761.46	153.5787	96.12	0.000	14460.45	15062.47
OTHER	5011.156	157.3413	31.85	0.000	4702.773	5319.54
PLAYOFF SPORTS	33270.82	235.6397	141.19	0.000	32808.97	33732.67
PSEUDO-SPORTS	9070.077	1223.328	7.41	0.000	6672.398	11467.76
PUBLIC AFFAIRS	8888.009	277.8837	31.98	0.000	8343.366	9432.651
RELIGIOUS	5698.703	214.4507	26.57	0.000	5278.387	6119.019
SPECIAL	12243.96	237.4303	51.57	0.000	11778.61	12709.32
SPORTING EVENT	7794.018	177.0969	44.01	0.000	7446.915	8141.122
SPORTS ANTHOLOGY	3766.231	343.9122	10.95	0.000	3092.175	4440.287
SPORTS-RELATED	12971.48	204.2637	63.50	0.000	12571.13	13371.83

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

```
      SYNDICATED  |   8893.532    152.6181     58.27   0.000      8594.406     9192.658
      TALK SHOW   |   8291.583    150.0093     55.27   0.000       7997.57     8585.596
   TEAM VS. TEAM  |   31534.14    185.0622    170.40   0.000      31171.42     31896.85
       TV MOVIE   |   5747.459    566.1434     10.15   0.000      4637.837      6857.08
                  |
           _cons  |  -207.4533    202.4323     -1.02   0.305     -604.2134     189.3069
--------------------------------------------------------------------------------------
```

*** 2012 ***

. reg total i.qtr i.program_type

```
      Source |       SS           df       MS      Number of obs   = 2,875,367
-------------+----------------------------------   F(121, 2875245) =   2268.82
       Model |  1.6883e+14        121  1.3953e+12   Prob > F        =    0.0000
    Residual |  1.7683e+15  2,875,245   614996896   R-squared       =    0.0872
-------------+----------------------------------   Adj R-squared   =    0.0871
       Total |  1.9371e+15  2,875,366   673688153   Root MSE        =     24799
```

```
--------------------------------------------------------------------------------
       total |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+------------------------------------------------------------------
         qtr |
          2  |  -1134.569    199.1348    -5.70   0.000    -1524.866    -744.2713
          3  |  -1379.708    182.2207    -7.57   0.000    -1736.854    -1022.562
          4  |  -2494.241    199.2205   -12.52   0.000    -2884.706    -2103.776
          5  |  -3338.028    184.8252   -18.06   0.000    -3700.279    -2975.777
          6  |  -3938.017    199.4004   -19.75   0.000    -4328.834    -3547.199
          7  |  -4205.677    182.8918   -23.00   0.000    -4564.138    -3847.215
          8  |  -4885.608    199.6598   -24.47   0.000    -5276.934    -4494.282
          9  |  -4333.481     183.665   -23.59   0.000    -4693.458    -3973.505
         10  |  -4881.165    200.0895   -24.39   0.000    -5273.333    -4488.997
         11  |  -5077.686    190.4964   -26.66   0.000    -5451.052    -4704.319
         12  |  -5450.306    200.0672   -27.24   0.000     -5842.43    -5058.181
         13  |  -5742.539    192.8851   -29.77   0.000    -6120.587    -5364.491
         14  |   -6354.61    201.3414   -31.56   0.000    -6749.232    -5959.988
         15  |  -6225.827    197.6464   -31.50   0.000    -6613.207    -5838.447
         16  |  -6314.699    201.5508   -31.33   0.000    -6709.731    -5919.666
         17  |  -6959.225    197.9744   -35.15   0.000    -7347.248    -6571.202
         18  |  -6963.425    200.7125   -34.69   0.000    -7356.814    -6570.035
         19  |  -7217.819    200.6939   -35.96   0.000    -7611.172    -6824.466
         20  |  -6743.525    201.9777   -33.39   0.000    -7139.394    -6347.656
         21  |  -5804.557    202.4334   -28.67   0.000     -6201.32    -5407.795
         22  |  -5258.599    202.5906   -25.96   0.000    -5655.669    -4861.528
         23  |  -4428.084    202.4333   -21.87   0.000    -4824.846    -4031.322
         24  |  -3499.353    202.5783   -17.27   0.000      -3896.4    -3102.307
         25  |  -2703.856    202.5096   -13.35   0.000    -3100.767    -2306.944
         26  |  -1846.148    202.5893    -9.11   0.000    -2243.215     -1449.08
         27  |  -1399.432    202.8833    -6.90   0.000    -1797.077    -1001.788
         28  |  -403.8917    202.8853    -1.99   0.047    -801.5399    -6.243593
         29  |    3838.12    200.7588    19.12   0.000     3444.639       4231.6
         30  |   3958.384    200.7588    19.72   0.000     3564.903     4351.864
         31  |   3360.275    200.8099    16.73   0.000     2966.695     3753.855
         32  |   3412.745    200.8099    16.99   0.000     3019.164     3806.325
         33  |   4075.622    200.7374    20.30   0.000     3682.184     4469.061
```

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

34	|	4035.586	200.7355	20.10	0.000	3642.151	4429.021
35	|	3889.886	200.7194	19.38	0.000	3496.483	4283.289
36	|	3991.659	200.7042	19.89	0.000	3598.286	4385.033
37	|	4566.968	200.4494	22.78	0.000	4174.095	4959.842
38	|	3535.487	200.431	17.64	0.000	3142.649	3928.324
39	|	3086.953	200.4665	15.40	0.000	2694.045	3479.86
40	|	3162.854	200.4368	15.78	0.000	2770.005	3555.703
41	|	4729.955	200.4446	23.60	0.000	4337.091	5122.819
42	|	3206.009	200.6383	15.98	0.000	2812.765	3599.253
43	|	3179.142	200.7079	15.84	0.000	2785.761	3572.522
44	|	3458.359	200.7098	17.23	0.000	3064.974	3851.743
45	|	2880.849	200.7042	14.35	0.000	2487.476	3274.222
46	|	2031.426	200.7344	10.12	0.000	1637.994	2424.858
47	|	2160.986	200.6553	10.77	0.000	1767.709	2554.263
48	|	2570.072	200.63	12.81	0.000	2176.844	2963.299
49	|	575.709	199.8824	2.88	0.004	183.9465	967.4715
50	|	-167.7279	200.6781	-0.84	0.403	-561.05	225.5942
51	|	-33.54331	201.15	-0.17	0.868	-427.7902	360.7036
52	|	-138.1253	201.1314	-0.69	0.492	-532.3357	256.0852
53	|	871.4086	201.4401	4.33	0.000	476.5931	1266.224
54	|	-107.1704	201.7488	-0.53	0.595	-502.591	288.2502
55	|	-305.7179	201.7372	-1.52	0.130	-701.1156	89.67992
56	|	-359.0228	201.647	-1.78	0.075	-754.2439	36.19825
57	|	-175.4344	200.3919	-0.88	0.381	-568.1955	217.3268
58	|	-967.2291	200.5393	-4.82	0.000	-1360.279	-574.1792
59	|	-962.497	200.6436	-4.80	0.000	-1355.751	-569.2426
60	|	-439.0783	200.6587	-2.19	0.029	-832.3622	-45.79434
61	|	626.4503	199.852	3.13	0.002	234.7473	1018.153
62	|	13.56247	200.0876	0.07	0.946	-378.6022	405.7272
63	|	201.9397	200.2044	1.01	0.313	-190.4538	594.3332
64	|	824.0171	200.4136	4.11	0.000	431.2135	1216.821
65	|	1648.9	199.765	8.25	0.000	1257.368	2040.433
66	|	1252.55	200.0671	6.26	0.000	860.4256	1644.675
67	|	1594.153	200.1664	7.96	0.000	1201.834	1986.472
68	|	2745.326	200.1502	13.72	0.000	2353.039	3137.614
69	|	2372.028	200.7625	11.82	0.000	1978.541	2765.516
70	|	2216.57	201.1843	11.02	0.000	1822.256	2610.884
71	|	1830.496	201.3464	9.09	0.000	1435.864	2225.128
72	|	2672.684	201.4981	13.26	0.000	2277.755	3067.614
73	|	5188.946	200.8713	25.83	0.000	4795.245	5582.647
74	|	5661.429	201.3453	28.12	0.000	5266.799	6056.058
75	|	7078.99	200.4501	35.32	0.000	6686.114	7471.865
76	|	7878.309	200.5545	39.28	0.000	7485.229	8271.389
77	|	10383.99	200.3642	51.83	0.000	9991.288	10776.7
78	|	8782.286	200.4994	43.80	0.000	8389.315	9175.258
79	|	9173.178	199.9116	45.89	0.000	8781.358	9564.997
80	|	10771.29	200.8773	53.62	0.000	10377.58	11165
81	|	15632.11	202.3413	77.26	0.000	15235.53	16028.69
82	|	12905.87	203.325	63.47	0.000	12507.36	13304.38
83	|	13563.03	201.5428	67.30	0.000	13168.01	13958.05
84	|	13458.73	204.1031	65.94	0.000	13058.7	13858.77
85	|	16738.3	200.5368	83.47	0.000	16345.26	17131.35
86	|	12401.11	203.7551	60.86	0.000	12001.76	12800.47
87	|	12753.11	202.0565	63.12	0.000	12357.09	13149.14
88	|	12576.95	204.071	61.63	0.000	12176.98	12976.92
89	|	16444.26	198.644	82.78	0.000	16054.93	16833.6
90	|	10362.56	200.4559	51.69	0.000	9969.676	10755.45

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

```
          91 |    7670.589    188.7976    40.63   0.000     7300.552    8040.626
          92 |    8932.985    199.9967    44.67   0.000     8540.998    9324.971
          93 |    6270.291    196.7314    31.87   0.000     5884.704    6655.877
          94 |    3459.032    198.6107    17.42   0.000     3069.762    3848.302
          95 |    3325.332     181.209    18.35   0.000     2970.169    3680.496
          96 |    1299.767    198.8068     6.54   0.000     910.1129    1689.422
             |
program_type |
CHILDREN'S SHOW |   468.3315    238.0134     1.97   0.049      1.83357    934.8294
CHILDREN'S SPECIAL | 4510.224   629.2136     7.17   0.000     3276.988    5743.461
 DAYTIME SOAP |   10801.5    200.3678    53.91   0.000     10408.79    11194.22
      FINANCE |   7703.972    258.3187    29.82   0.000     7197.676    8210.267
    GAME SHOW |   9254.764    188.7339    49.04   0.000     8884.852    9624.676
       HEALTH |   6969.864    393.0563    17.73   0.000     6199.487     7740.24
 INSTRUCTIONAL |  8823.995    355.4295    24.83   0.000     8127.366    9520.624
   MINI-SERIES |  9355.747    1419.775     6.59   0.000     6573.039    12138.46
        MOVIE |   5594.599    201.7152    27.74   0.000     5199.244    5989.953
        MUSIC |   21622.66    254.9079    84.83   0.000     21123.05    22122.27
 MUSIC SPECIAL |  12412.44    454.3943    27.32   0.000     11521.85    13303.04
NETWORK SERIES |  8963.884    184.3134    48.63   0.000     8602.636    9325.132
         NEWS |   14599.41    174.1545    83.83   0.000     14258.08    14940.75
        OTHER |   5227.397    177.3536    29.47   0.000      4879.79    5575.004
PLAYOFF SPORTS |  31342.45    245.8267   127.50   0.000     30860.64    31824.26
PSEUDO-SPORTS |   4052.997     806.565     5.03   0.000     2472.157    5633.836
PUBLIC AFFAIRS |  6937.928    374.7658    18.51   0.000       6203.4    7672.456
    RELIGIOUS |   3423.466     222.004    15.42   0.000     2988.346    3858.586
      SPECIAL |   13132.55    254.9068    51.52   0.000     12632.94    13632.16
SPORTING EVENT |  18527.72    193.6644    95.67   0.000     18148.14     18907.3
SPORTS ANTHOLOGY | 4934.095   381.845     12.92   0.000     4185.693    5682.498
SPORTS-RELATED |  12487.52    211.6606    59.00   0.000     12072.67    12902.37
   SYNDICATED |   8866.615    173.0862    51.23   0.000     8527.372    9205.857
    TALK SHOW |   8148.213    170.8265    47.70   0.000     7813.399    8483.027
 TEAM VS. TEAM |  27099.51    200.4537   135.19   0.000     26706.63     27492.4
     TV MOVIE |   11891.44    710.9748    16.73   0.000     10497.95    13284.92
             |
        _cons |  -455.7868    217.5243    -2.10   0.036    -882.1268   -29.44679
-------------------------------------------------------------------------------
```


*** 2013 ***

. reg total i.qtr i.program_type

```
      Source |       SS           df       MS      Number of obs   = 2,429,800
-------------+----------------------------------   F(120, 2429679) =   2263.08
       Model |  1.4534e+14        120  1.2112e+12   Prob > F        =    0.0000
    Residual |  1.3004e+15  2,429,679   535199874   R-squared       =    0.1005
-------------+----------------------------------   Adj R-squared   =    0.1005
       Total |  1.4457e+15  2,429,799   594990701   Root MSE        =      23134


-------------------------------------------------------------------------------
       total |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+-----------------------------------------------------------------
         qtr |
           2 |  -703.2218    201.9944    -3.48   0.000    -1099.124    -307.3199
```

PUBLIC VERSION

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

3	-643.0193	183.152	-3.51	0.000	-1001.991	-284.0477
4	-2242.58	202.0574	-11.10	0.000	-2638.606	-1846.555
5	-3268.415	187.6459	-17.42	0.000	-3636.194	-2900.635
6	-3878.927	202.2943	-19.17	0.000	-4275.417	-3482.438
7	-4227.365	185.0062	-22.85	0.000	-4589.971	-3864.76
8	-5064.761	202.3736	-25.03	0.000	-5461.406	-4668.115
9	-4449.136	186.5335	-23.85	0.000	-4814.735	-4083.536
10	-4960.724	203.169	-24.42	0.000	-5358.928	-4562.52
11	-5314.615	192.7359	-27.57	0.000	-5692.371	-4936.86
12	-5748.563	202.7493	-28.35	0.000	-6145.944	-5351.181
13	-6157.166	196.5971	-31.32	0.000	-6542.489	-5771.843
14	-6652.608	203.9765	-32.61	0.000	-7052.395	-6252.821
15	-6561.772	200.4412	-32.74	0.000	-6954.63	-6168.914
16	-6576.713	204.2625	-32.20	0.000	-6977.061	-6176.366
17	-7357.472	201.1357	-36.58	0.000	-7751.691	-6963.253
18	-7187.957	203.3808	-35.34	0.000	-7586.576	-6789.338
19	-6804.625	203.3629	-33.46	0.000	-7203.209	-6406.041
20	-6289.26	204.6559	-30.73	0.000	-6690.379	-5888.142
21	-5315.89	205.0568	-25.92	0.000	-5717.794	-4913.986
22	-4818.634	205.1919	-23.48	0.000	-5220.803	-4416.465
23	-3851.317	205.1772	-18.77	0.000	-4253.457	-3449.177
24	-3009.212	205.3061	-14.66	0.000	-3411.604	-2606.819
25	-2734.585	205.0803	-13.33	0.000	-3136.535	-2332.635
26	-1865.68	205.2066	-9.09	0.000	-2267.877	-1463.482
27	-928.6863	205.3899	-4.52	0.000	-1331.243	-526.1293
28	207.641	205.3729	1.01	0.312	-194.8826	610.1646
29	4171.835	203.469	20.50	0.000	3773.043	4570.627
30	4285.637	203.4898	21.06	0.000	3886.804	4684.47
31	3695.606	203.5283	18.16	0.000	3296.698	4094.515
32	3300.325	203.4868	16.22	0.000	2901.498	3699.152
33	3967.887	203.4353	19.50	0.000	3569.161	4366.613
34	3828.527	203.4605	18.82	0.000	3429.752	4227.303
35	3603.372	203.3955	17.72	0.000	3204.724	4002.02
36	3645.825	203.4046	17.92	0.000	3247.159	4044.491
37	4035.531	203.3024	19.85	0.000	3637.065	4433.997
38	3073.574	203.2276	15.12	0.000	2675.255	3471.893
39	2725.932	203.2495	13.41	0.000	2327.57	3124.294
40	2799.303	203.2404	13.77	0.000	2400.959	3197.647
41	4397.58	203.293	21.63	0.000	3999.133	4796.028
42	3097.781	203.5235	15.22	0.000	2698.882	3496.68
43	2859.611	203.4021	14.06	0.000	2460.95	3258.272
44	2990.655	203.3773	14.70	0.000	2592.043	3389.267
45	2936.527	203.3631	14.44	0.000	2537.942	3335.112
46	2145.338	203.309	10.55	0.000	1746.86	2543.817
47	2190.503	203.3211	10.77	0.000	1792.001	2589.005
48	2385.475	203.2878	11.73	0.000	1987.038	2783.912
49	506.377	202.6024	2.50	0.012	109.2835	903.4705
50	-162.891	203.4355	-0.80	0.423	-561.6175	235.8355
51	355.9721	203.9273	1.75	0.081	-43.7183	755.6626
52	255.3951	203.8364	1.25	0.210	-144.117	654.9073
53	1630.648	204.4262	7.98	0.000	1229.98	2031.317
54	707.2594	204.6893	3.46	0.001	306.0756	1108.443
55	354.8481	204.8018	1.73	0.083	-46.5562	756.2524
56	455.2417	204.8032	2.22	0.026	53.83467	856.6487
57	821.2846	203.3211	4.04	0.000	422.7824	1219.787
58	-40.54262	203.3634	-0.20	0.842	-439.1277	358.0425
59	31.27672	203.3118	0.15	0.878	-367.2072	429.7606

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

60	534.2764	203.4969	2.63	0.009	135.4296	933.1232
61	1760.381	202.6862	8.69	0.000	1363.123	2157.639
62	935.0568	202.848	4.61	0.000	537.4818	1332.632
63	1114.713	202.8584	5.50	0.000	717.1181	1512.309
64	1897.958	203.1495	9.34	0.000	1499.792	2296.123
65	2594.49	202.6489	12.80	0.000	2197.305	2991.674
66	2545.116	202.8146	12.55	0.000	2147.607	2942.626
67	3067.614	202.8221	15.12	0.000	2670.09	3465.139
68	3823.166	203.0274	18.83	0.000	3425.24	4221.093
69	2938.222	203.5461	14.44	0.000	2539.279	3337.166
70	2756.713	203.8026	13.53	0.000	2357.267	3156.159
71	2995.1	203.9133	14.69	0.000	2595.437	3394.763
72	4177.738	204.0758	20.47	0.000	3777.756	4577.719
73	5437.149	203.81	26.68	0.000	5037.688	5836.609
74	5601.568	204.2257	27.43	0.000	5201.293	6001.843
75	6293.684	203.1996	30.97	0.000	5895.42	6691.948
76	7165.427	203.3164	35.24	0.000	6766.934	7563.921
77	9387.859	203.2457	46.19	0.000	8989.505	9786.214
78	7821.681	203.5545	38.43	0.000	7422.721	8220.64
79	7928.778	202.5281	39.15	0.000	7531.83	8325.726
80	9557.751	203.7936	46.90	0.000	9158.323	9957.179
81	13757.6	205.7672	66.86	0.000	13354.3	14160.89
82	10933.93	206.8009	52.87	0.000	10528.61	11339.26
83	11833.45	204.9667	57.73	0.000	11431.73	12235.18
84	11495.01	207.7543	55.33	0.000	11087.82	11902.2
85	15587.68	202.4936	76.98	0.000	15190.8	15984.56
86	11429.3	207.0942	55.19	0.000	11023.4	11835.2
87	11684.11	205.3418	56.90	0.000	11281.64	12086.57
88	11334.22	207.5208	54.62	0.000	10927.48	11740.95
89	17974.1	198.8672	90.38	0.000	17584.33	18363.88
90	10441.94	203.6703	51.27	0.000	10042.75	10841.12
91	7821.802	193.1452	40.50	0.000	7443.244	8200.36
92	8818.162	203.1754	43.40	0.000	8419.945	9216.379
93	6824.471	199.9592	34.13	0.000	6432.558	7216.384
94	3578.394	201.5566	17.75	0.000	3183.35	3973.438
95	3665.891	183.1655	20.01	0.000	3306.893	4024.889
96	1759.359	201.7407	8.72	0.000	1363.955	2154.764
program_type						
CHILDREN'S SHOW	517.3722	262.4616	1.97	0.049	2.956666	1031.788
CHILDREN'S SPECIAL	4786.64	656.4052	7.29	0.000	3500.109	6073.171
DAYTIME SOAP	10840.93	202.4954	53.54	0.000	10444.05	11237.82
FINANCE	6693.552	263.675	25.39	0.000	6176.758	7210.345
GAME SHOW	9463.336	189.0891	50.05	0.000	9092.728	9833.944
HEALTH	5523.091	337.5952	16.36	0.000	4861.416	6184.766
INSTRUCTIONAL	8457.582	359.8697	23.50	0.000	7752.25	9162.914
MOVIE	4182.863	202.8368	20.62	0.000	3785.31	4580.416
MUSIC	25195.92	262.7388	95.90	0.000	24680.96	25710.88
MUSIC SPECIAL	13129.72	404.8202	32.43	0.000	12336.29	13923.16
NETWORK SERIES	10993.32	184.9207	59.45	0.000	10630.88	11355.76
NEWS	13558.61	173.9608	77.94	0.000	13217.66	13899.57
OTHER	4788.031	177.4436	26.98	0.000	4440.248	5135.815
PLAYOFF SPORTS	33761.46	250.085	135.00	0.000	33271.3	34251.61
PSEUDO-SPORTS	2225.757	689.3521	3.23	0.001	874.6512	3576.863
PUBLIC AFFAIRS	6277.813	366.7697	17.12	0.000	5558.957	6996.669
RELIGIOUS	2297.807	224.6587	10.23	0.000	1857.484	2738.13
SPECIAL	12099.48	241.6763	50.06	0.000	11625.8	12573.16

Details of Gray Alternative Distant Viewing Estimates: Gray Total Viewing Regression (Model 4)

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      SPORTING EVENT  |    8456.23   206.3147    40.99   0.000     8051.86   8860.599
    SPORTS ANTHOLOGY  |   3932.692   386.9434    10.16   0.000    3174.296   4691.087
       SPORTS-RELATED |    13414.3   215.5236    62.24   0.000    12991.88   13836.72
           SYNDICATED |   8640.874    172.939    49.96   0.000     8301.92   8979.829
            TALK SHOW |   7190.433   170.6396    42.14   0.000    6855.985    7524.88
        TEAM VS. TEAM |   27458.73   200.9249   136.66   0.000    27064.93   27852.54
             TV MOVIE |   16491.05   753.7467    21.88   0.000    15013.73   17968.37
                      |
                _cons |   10.16624   218.0302     0.05   0.963   -417.1652   437.4977
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Appendix J: Top 200 most viewed programs in 2010 according to Dr. Gray

Appendix J: Top 200 Most Viewed Programs in 2010 according to Gray Model 1

rank	title	program type	Gray Predicted Distant Viewing	Distant Subscribers across programs	Viewing/ Subscribers
1	Â-TRES AMIGOS!	PELICULA	174,402	1,232,264	0.14152999
2	CORRETEANDO LA MUERTE	PELICULA	174,402	1,232,264	0.14152999
3	TRAFICANTES DE MUERTE	PELICULA	174,402	1,232,264	0.14152999
4	CACERÂ¡A DE JUDICIALES	PELICULA	174,590	1,234,024	0.14148024
5	CUERNO DE CHIVO	PELICULA	174,590	1,234,024	0.14148024
6	RAZA DE TRAFICANTES	PELICULA	174,590	1,234,024	0.14148024
7	LA FUGA DE ARIZMENDI II	PELICULA	174,590	1,234,024	0.14148024
8	CON TODA EL ARMA	PELICULA	175,004	1,237,904	0.14137086
9	LOS PELUQUEROS	PELICULA	175,004	1,237,904	0.14137086
10	TIJUANA, CIUDAD DE NARCOS	PELICULA	175,004	1,237,904	0.14137086
11	ALASKA	PELICULA	207,862	1,555,400	0.13363876
12	AVALANCHA	PELICULA	207,862	1,555,400	0.13363876
13	BULLETPROOF MONK	PELICULA	207,862	1,555,400	0.13363876
14	CON GANAS DE TRIUNFAR	PELICULA	207,862	1,555,400	0.13363876
15	CRANK, MUERTE ANUNCIADA	PELICULA	207,862	1,555,400	0.13363876
16	CUATRO DRAGONES	PELICULA	207,862	1,555,400	0.13363876
17	DIRECT ACTION	PELICULA	207,862	1,555,400	0.13363876
18	EL SILENCIADOR	PELICULA	207,862	1,555,400	0.13363876
19	ESPÂ¡A POR ACCIDENTE	PELICULA	207,862	1,555,400	0.13363876
20	HIJOS DE LA MAFIA	PELICULA	207,862	1,555,400	0.13363876
21	KICKBOXER V: LA VENGANZA	PELICULA	207,862	1,555,400	0.13363876
22	WHITE HOUSE	PELICULA	207,862	1,555,400	0.13363876
23	OPERACIÂ¢N FRANCOTIRADOR	PELICULA	207,862	1,555,400	0.13363876
24	PUÂ¤O DE GUERRERO	PELICULA	207,862	1,555,400	0.13363876
25	ROBOCOP 3	PELICULA	207,862	1,555,400	0.13363876
26	THE SCORPION KING	PELICULA	207,862	1,555,400	0.13363876
27	TODO POR DINERO	PELICULA	207,862	1,555,400	0.13363876
28	UNDERWORLD: EVOLUTION	PELICULA	207,862	1,555,400	0.13363876
29	MOTÂ¡N DEL BOUNTY	PELICULA	155,378	1,166,550	0.1331942
30	CONSPIRACIÂ¢N VIOLENTA	PELICULA	428,183	3,235,704	0.13233066
31	PERSEGUIDOS	PELICULA	428,183	3,235,704	0.13233066
32	GHOST RIDER	PELICULA	256,588	1,944,250	0.13197296
33	ATERRIZAJE FORZOSO	PELICULA	217,952	1,656,376	0.13158391
34	CERO ABSOLUTO: INFIERNO BLANCO	PELICULA	217,952	1,656,376	0.13158391
35	CONTACTO SANGRIENTO 4: EL AGRESOR	PELICULA	217,952	1,656,376	0.13158391
36	EL HUÂ,SPED MALDITO	PELICULA	217,952	1,656,376	0.13158391
37	EPICENTRO	PELICULA	217,952	1,656,376	0.13158391
38	FAMILIA DE POLICÂ¡AS	PELICULA	217,952	1,656,376	0.13158391
39	JEEPERS CREEPERS 2	PELICULA	217,952	1,656,376	0.13158391

Appendix J: Top 200 Most Viewed Programs in 2010 according to Gray Model 1

rank	title	program type	Gray Predicted Distant Viewing	Distant Subscribers across programs	Viewing/ Subscribers
40	LA TRAICIÂ¢N	PELICULA	217,952	1,656,376	0.13158391
41	MEDIO MUERTO	PELICULA	217,952	1,656,376	0.13158391
42	THE DAY AFTER TOMORROW	PELICULA	217,952	1,656,376	0.13158391
43	ZONA DE IMPACTO	PELICULA	217,952	1,656,376	0.13158391
44	ATRAPADOS	PELICULA	217,952	1,656,376	0.13158391
45	DE LADRÂ¢N A POLICÂ¡A	PELICULA	217,952	1,656,376	0.13158391
46	PITCH BLACK	PELICULA	217,952	1,656,376	0.13158391
47	ALIEN CONTRA DEPREDADOR	PELICULA	220,321	1,680,304	0.13111979
48	COMPLOT EN HONG KONG	PELICULA	220,321	1,680,304	0.13111979
49	CONFESIONES DE UN COMBATIENTE	PELICULA	220,321	1,680,304	0.13111979
50	DELITO GRAVE	PELICULA	220,321	1,680,304	0.13111979
51	EL PODER DEL TALISMÂ N	PELICULA	220,321	1,680,304	0.13111979
52	EQUILIBRIO DE PODER	PELICULA	220,321	1,680,304	0.13111979
53	ERASER, EL PROTECTOR	PELICULA	220,321	1,680,304	0.13111979
54	FUERZA DE ATAQUE	PELICULA	220,321	1,680,304	0.13111979
55	HOMICIDIO EN LA PASARELA	PELICULA	220,321	1,680,304	0.13111979
56	JUEGO MORTAL	PELICULA	220,321	1,680,304	0.13111979
57	LA NOCHE DEL HALCÂ¢N	PELICULA	220,321	1,680,304	0.13111979
58	OBJETIVO, EL PRESIDENTE	PELICULA	220,321	1,680,304	0.13111979
59	ROCKY BALBOA	PELICULA	220,321	1,680,304	0.13111979
60	SHARPSHOOTER	PELICULA	220,321	1,680,304	0.13111979
61	THE TRANSPORTER	PELICULA	220,321	1,680,304	0.13111979
62	RUSH HOUR 3	PELICULA	222,811	1,705,552	0.13063891
63	ACCIÂ¢N EVASIVA	PELICULA	222,811	1,705,552	0.13063891
64	AGENDA OCULTA	PELICULA	222,811	1,705,552	0.13063891
65	AZUL INTENSO	PELICULA	222,811	1,705,552	0.13063891
66	BAJO SITIO	PELICULA	222,811	1,705,552	0.13063891
67	DAGAS GEMELAS	PELICULA	222,811	1,705,552	0.13063891
68	DAREDEVIL	PELICULA	222,811	1,705,552	0.13063891
69	EL DEMOLEDOR	PELICULA	222,811	1,705,552	0.13063891
70	EL GUARDAESPALDAS: UN NUEVO COMIENZO	PELICULA	222,811	1,705,552	0.13063891
71	ENLACE ESCAPE EN LA ZONA 14	PELICULA	222,811	1,705,552	0.13063891
72	FAMILIA DE POLICÂ¡A II: FALTA DE FIDELIDAD	PELICULA	222,811	1,705,552	0.13063891
73	IMPACTO INMINENTE	PELICULA	222,811	1,705,552	0.13063891
74	JUSTICIA URBANA	PELICULA	222,811	1,705,552	0.13063891
75	LA JUSTICIA DEL DRAGON	PELICULA	222,811	1,705,552	0.13063891
76	LAS FOCAS MARINAS	PELICULA	222,811	1,705,552	0.13063891

Appendix J: Top 200 Most Viewed Programs in 2010 according to Gray Model 1

rank	title	program type	Gray Predicted Distant Viewing	Distant Subscribers across programs	Viewing/ Subscribers
77	MEDIO MUERTO 2	PELICULA	222,811	1,705,552	0.13063891
78	PRIMEVAL	PELICULA	222,811	1,705,552	0.13063891
79	SOMBRA GUERRERA	PELICULA	222,811	1,705,552	0.13063891
80	TEMBLORES	PELICULA	222,811	1,705,552	0.13063891
81	THE HUNT	PELICULA	222,811	1,705,552	0.13063891
82	TRAPPED	PELICULA	222,811	1,705,552	0.13063891
83	WILD WILD WEST	PELICULA	222,811	1,705,552	0.13063891
84	EL CANTANTE	PELICULA	271,969	2,100,380	0.12948538
85	UN JUEGO VS. EL DESTINO	PELICULA	275,043	2,131,940	0.1290105
86	LOS CUATES DEL PIRRURIS	PELICULA	175,526	1,371,848	0.12794823
87	EL SIGNO DE LA MUERTE	PELICULA	161,837	1,267,920	0.12763984
88	MÂ£SICO, POETA Y LOCO	PELICULA	161,837	1,267,920	0.12763984
89	POLICÂ¡A JUDICIAL FEDERAL	PELICULA	177,856	1,396,072	0.12739768
90	INTERVIEW WITH THE VAMPIRE	PELICULA	177,856	1,396,072	0.12739768
91	POINT OF NO RETURN	PELICULA	177,856	1,396,072	0.12739768
92	AQUI NADIE SE RAJA	PELICULA	177,939	1,396,928	0.12737844
93	EL NEGOCIO DEL ODIO	PELICULA	177,939	1,396,928	0.12737844
94	GRUPO ESPECIAL ANTISECUESTROS	PELICULA	177,939	1,396,928	0.12737844
95	EL FUGITIVO	PELICULA	242,003	1,944,250	0.1244711
96	SPIDER-MAN 2	PELICULA	498,815	4,014,720	0.12424646
97	THE SKELETON KEY	PELICULA	192,948	1,555,400	0.12405063
98	FURIA EN LA CALLE	PELICULA	192,948	1,555,400	0.12405063
99	SOCIEDAD SECRETA 2	PELICULA	192,948	1,555,400	0.12405063
100	I, ROBOT	PELICULA	256,812	2,070,470	0.12403551
101	LA LIGA EXTRAORDINARIA	PELICULA	256,812	2,070,470	0.12403551
102	BANDITS	PELICULA	253,751	2,070,470	0.12255721
103	DEPREDADOR	PELICULA	202,315	1,656,376	0.1221432
104	END OF DAYS	PELICULA	202,315	1,656,376	0.1221432
105	HOMBRES DE GUERRA	PELICULA	202,315	1,656,376	0.1221432
106	UN DETECTIVE SUELTO EN HOLLYWOOD 3	PELICULA	202,315	1,656,376	0.1221432
107	MAN ON FIRE	PELICULA	256,509	2,100,380	0.12212493
108	CARRERA CONTRA LA MUERTE	PELICULA	487,777	4,000,504	0.12192887
109	THE FAST AND THE FURIOUS: TOKYO DRIFT	PELICULA	204,514	1,680,304	0.12171239
110	DINERO SUCIO	PELICULA	204,514	1,680,304	0.12171239
111	SIGNS	PELICULA	204,514	1,680,304	0.12171239
112	EL PROTEGIDO	PELICULA	188,784	1,555,400	0.121373
113	LA JUSTICIA DE UN HOMBRE	PELICULA	206,825	1,705,552	0.12126601

Appendix J: Top 200 Most Viewed Programs in 2010 according to Gray Model 1

rank	title	program type	Gray Predicted Distant Viewing	Distant Subscribers across programs	Viewing/ Subscribers
114	THE CONTRACTOR	PELICULA	206,825	1,705,552	0.12126601
115	BLADE: TRINITY	PELICULA	206,825	1,705,552	0.12126601
116	EXTERMINADOR	PELICULA	206,825	1,705,552	0.12126601
117	OPERACIÂ¢N DELTA FORCE 5	PELICULA	206,825	1,705,552	0.12126601
118	MUERTE EN EL BARRIO JAPONÂ‚S	PELICULA	139,729	1,166,550	0.11977967
119	STUART LITTLE 3: EL LADO SALVAJE	PELICULA	139,729	1,166,550	0.11977967
120	EL INFIERNO: LLAMAS SOBRE BERLÂ¡N	PELICULA	197,948	1,656,376	0.11950674
121	EL VALIENTE BOBBY	PELICULA	197,948	1,656,376	0.11950674
122	EL MOSQUETERO	PELICULA	197,948	1,656,376	0.11950674
123	EL Ã©LTIMO GUERRERO	PELICULA	197,948	1,656,376	0.11950674
124	STARGATE: THE ARK OF TRUTH	PELICULA	197,948	1,656,376	0.11950674
125	DOS DE ABAJO	PELICULA	307,743	2,583,952	0.11909781
126	GUERREROS DE LAS SOMBRAS II	PELICULA	200,099	1,680,304	0.11908522
127	EL FORASTERO	PELICULA	202,361	1,705,552	0.11864849
128	EL REGRESO DE LA LAGUNA AZUL	PELICULA	202,361	1,705,552	0.11864849
129	SOUTH FLORIDA HIGH SCHOOL SIGNING DAY	SPORTS-RELATED	61	514	0.1185598
130	COUNTDOWN TO THE BIG GAME	SPORTS-RELATED	121	1,028	0.1181521
131	GARFIELD	PELICULA	146,512	1,242,282	0.11793792
132	MY FIRST TIME: I'M A WINTER OLYMPIAN	SPORTS-RELATED	61	514	0.11774439
133	TOP DOG	PELICULA	148,104	1,260,228	0.11752193
134	ABA BASKETBALL	SPORTING EVENT	7,032	60,120	0.11697359
135	WALKING TALL	PELICULA	143,451	1,242,282	0.11547407
136	EL DESAFÂ¡O	PELICULA	143,451	1,242,282	0.11547407
137	FÂ£TBOL KUNG FU	PELICULA	143,451	1,242,282	0.11547407
138	POLICÂ¡A DE NARCÂ¢TICOS	PELICULA	302,264	2,630,952	0.11488766
139	ABA BASKETBALL	TEAM VS. TEAM	22,932	204,408	0.11218972
140	CIUDAD JUÂ REZ: TAN INFINITO COMO EL DESIERTO	MINI-SERIES	307,011	2,793,856	0.1098878
141	GIRLS HIGH SCHOOL VOLLEYBALL	PLAYOFF SPORTS	15,354	140,400	0.10935847
142	HEAT SPECIAL LIVE	SPORTS-RELATED	90	860	0.10444032
143	SOUTH FLORIDA SPORTS FINAL RIVALRY SPECIAL	SPORTS-RELATED	93	906	0.1031082

Appendix J: Top 200 Most Viewed Programs in 2010 according to Gray Model 1

rank	title	program type	Gray Predicted Distant Viewing	Distant Subscribers across programs	Viewing/ Subscribers
144	UNDER SIEGE 2	PELICULA	491,640	4,816,352	0.10207736
145	ESCAPE DE LOS ÂµNGELES	PELICULA	326,733	3,211,776	0.10172983
146	FÂ£TBOL DE ALCOBA	PELICULA	124,325	1,234,024	0.10074796
147	EL RIGOR DE LA LEY	PELICULA	124,325	1,234,024	0.10074796
148	CICLÂ¢N	PELICULA	126,171	1,258,384	0.10026395
149	LOS CUATES DEL PIRRURRIS	PELICULA	126,171	1,258,384	0.10026395
150	THE RUNDOWN	PELICULA	336,926	3,385,856	0.09950978
151	EL REY DE LA PLAYA	PELICULA	129,454	1,302,016	0.09942554
152	TRES LANCHEROS MUY PICUDOS	PELICULA	129,454	1,302,016	0.09942554
153	OPERATIVO CASABLANCA	PELICULA	131,815	1,333,624	0.09883975
154	PERRO CALLEJERO II	PELICULA	132,739	1,346,048	0.09861422
155	EL CHÂ CHARAS	PELICULA	250,268	2,548,976	0.09818364
156	LA REYNA DE SINALOA	PELICULA	250,268	2,548,976	0.09818364
157	EL SUPER POLICÂ¡A	PELICULA	252,650	2,604,112	0.09701955
158	LOS MANDADOS	PELICULA	253,877	2,630,096	0.09652747
159	LOS PISTOLEROS DEL TRAFICANTE	PELICULA	254,327	2,634,832	0.09652483
160	DANIEL EL TRAVIESO	PELICULA	149,547	1,555,400	0.09614727
161	EN LA MIRA	PELICULA	148,018	1,555,400	0.09516405
162	LA CASA DE LOS CUCHILLOS	PELICULA	148,018	1,555,400	0.09516405
163	ROCKY 5: LA Ã©LTIMA PELEA	PELICULA	148,018	1,555,400	0.09516405
164	DEPORTADOS	PELICULA	251,593	2,663,992	0.09444219
165	I SPY	PELICULA	321,613	3,411,104	0.094284
166	EL NOVATO	PELICULA	160,303	1,705,552	0.09398901
167	EL NIÂ¤O PERDIDO	PELICULA	231,359	2,475,808	0.09344775
168	THE WEDDING PLANNER	PELICULA	315,012	3,411,104	0.09234902
169	MONEY TRAIN	PELICULA	303,755	3,361,928	0.09035139
170	LOS JÂ¢VENES DEFENSORES	PELICULA	303,755	3,361,928	0.09035139
171	YOURJAX MUSIC	MUSIC	28,934	323,314	0.08949321
172	NHL PRESEASON HOCKEY	TEAM VS. TEAM	36,186	408,390	0.0886061
173	ENOUGH	PELICULA	294,516	3,361,928	0.08760323
174	KING KONG	PELICULA	438,397	5,078,784	0.08631928
175	COLMILLO BLANCO	PELICULA	290,316	3,385,856	0.08574383
176	NICO, SOBRE LA LEY	PELICULA	290,316	3,385,856	0.08574383
177	LA FUGA DEL ASESINO A SUELDO	PELICULA	285,902	3,385,856	0.08444004
178	METROMIX DC'S HOTTEST 5	MUSIC	3,069	36,512	0.08406136
179	CBS4 POSTGAME SHOW	SPORTS-RELATED	781	9,348	0.08358744
180	EL SEXTO DÂ¡A	PELICULA	419,056	5,042,232	0.08310928

Appendix J: Top 200 Most Viewed Programs in 2010 according to Gray Model 1

rank	title	program type	Gray Predicted Distant Viewing	Distant Subscribers across programs	Viewing/ Subscribers
181	CROWNING A CHAMPION	SPORTS-RELATED	354	4,272	0.08289627
182	EL MIEDO NO ANDA EN BURRO	PELICULA	25,067	302,928	0.08274954
183	DURO PERO SEGURO	PELICULA	25,067	302,928	0.08274954
184	NI DE AQUÂ¡ NI DE ALLÂ	PELICULA	25,067	302,928	0.08274954
185	INESPERADO AMOR	PELICULA	25,278	306,320	0.08252285
186	DETRÂ S DEL PARAÂ¡SO	PELICULA	25,278	306,320	0.08252285
187	DON QUIJOTE CABALGA DE NUEVO	PELICULA	25,278	306,320	0.08252285
188	LA RISA EN VACACIONES 9	PELICULA	25,278	306,320	0.08252285
189	OKEY MISTER PANCHO	PELICULA	25,464	309,304	0.082326
190	HIGH SCHOOL FOOTBALL	PLAYOFF SPORTS	328,445	3,990,600	0.08230469
191	UGA SIGNING DAY	SPORTS-RELATED	190	2,340	0.08105423
192	CBS ATLANTA SPORTSLINE SATURDAY	SPORTS-RELATED	3,377	42,114	0.08019577
193	COLLEGE HOCKEY	TEAM VS. TEAM	30,348	382,900	0.0792572
194	BEARS KICK OFF SEASON PREVIEW	SPORTS-RELATED	325	4,110	0.07908033
195	FALCONS SPECIAL	SPORTS-RELATED	206	2,606	0.07893261
196	SOR TEQUILA	PELICULA	23,815	302,928	0.07861619
197	GIRLS HIGH SCHOOL VOLLEYBALL	TEAM VS. TEAM	3,672	46,800	0.07846226
198	CBS 4 BRONCOS POST GAME REPORT	SPORTS-RELATED	789	10,064	0.07838779
199	ZONA DE PELIGRO	PELICULA	506,774	6,472,728	0.0782938
200	INFIERNO BAJO TIERRA	PELICULA	131,232	1,705,552	0.07694418

Appendix K: Lindstrom NPM estimates for distant viewing for WJTV 2011 and WAPT in 2012

Appendix K:

The figure below shows all 1,224 of the Nielsen estimates for distant viewing for WJTV in 2011. All of these 1,224 Lindstrom distant viewing estimates are impossible because they are larger than the number of distant subscribers (see blue line on chart).[1]

Figure K1: Nielsen Estimates of Distant Viewing Households versus Distant Subscribers for WJTV 2011
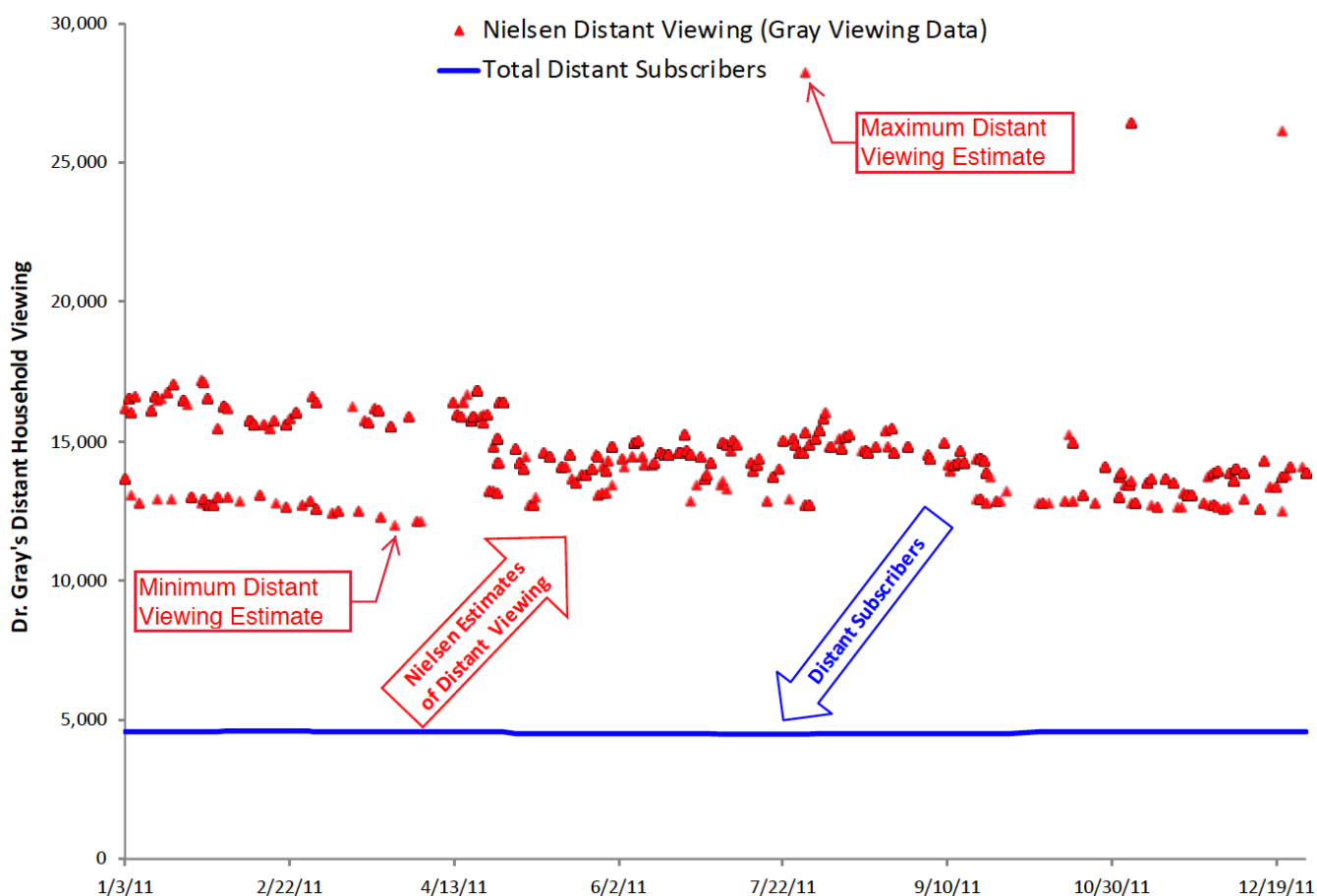
The following figure shows Dr. Gray's 2012 analysis data for all 1,416 records for WAPT with non-missing distant viewing. All of these 1,416 Lindstrom distant viewing estimates are

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[1] The most extreme Lindstrom distant viewing estimate is for the program "BLUE BLOODS" on July 29, 2011 where the Nielsen viewing estimate was ▮▮▮ — this distant viewing estimate is ▮▮ (▮▮▮▮▮▮▮) times larger than the number of distant subscribers. For WJTV in 2011, the estimate of distant viewing is always at least ▮▮▮ times the number of subscribers.

impossible because they are larger than the number of distant subscribers (see blue line on chart).

Figure K2: Nielsen Estimates of Distant Viewing Households
versus Distant Subscribers for WAPT 2012
1,416 of the Nielsen estimates for distant viewing for WAPT in 2012.[2]

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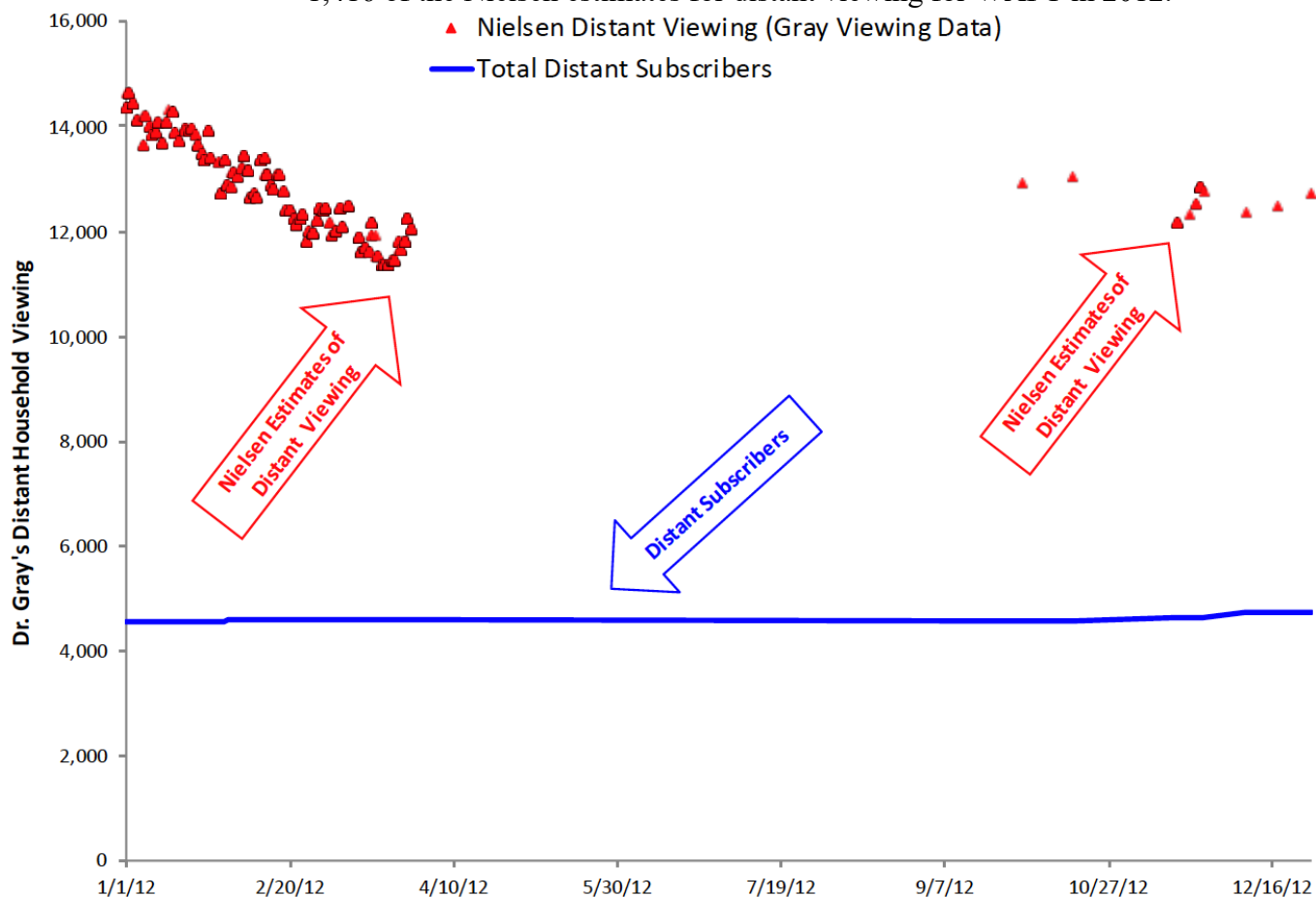
[2] See electronic file "017_WAPT.log". There are ▮ records within the Gray data that are tied for the most extreme Lindstrom distant viewing estimates; these programs are "WAPT 6AM NEWS", "LIVE! WITH KELLY", "GOOD MORNING AMERICA", "WAPT 10P NEWS", "NIGHTLINE" and two shows "FLOW COWBOY EXPOSED" and "THE CLOSER" which were broadcast at ▮ am and ▮ pm, respectively. The Lindstrom distant viewing estimates for all ▮ of these records is ▮ — this distant viewing estimate is ▮ (▮) times larger than the number of distant subscribers. Moreover, the Lindstrom data estimates that no program throughout all of 2012 was more viewed than "FLOW COWBOY EXPOSED" broadcast at ▮ am — this strains credibility. The estimate of distant viewing is zero (i.e., originally missing) for ▮ records and is positive for ▮ records

Appendix L: Proportion of Records Greater than the Ratio of Lindstrom NPM Distant Viewing Divided by Total Distant Subscribers

Appendix L

Table L: Proportion of Records Greater than the Ratio of
Lindstrom NPM Distant Viewing Divided by Total Distant Subscribers

Records >= Ratio	Lindstrom NPM Records Grouped by Total Subscribers for Each Station													
	0-10k		10k-20k		20k-50k		50k-100k		100k-500k		500k-1M		1M+	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
0.001	43,692	100%	28,046	100%	54,009	100%	12,455	100%	393,142	100%	77,655	100%	144,263	84%
0.005	43,692	100%	28,046	100%	54,009	100%	12,455	100%	387,510	99%	72,415	93%	64,207	37%
0.01	43,692	100%	28,046	100%	54,009	100%	12,455	100%	328,311	84%	61,551	79%	18,254	11%
0.02	43,692	100%	28,046	100%	54,009	100%	12,447	100%	279,990	71%	50,877	66%	3,712	2%
0.03	43,692	100%	28,046	100%	54,009	100%	11,931	96%	249,843	64%	25,301	33%	1,043	1%
0.04	43,692	100%	28,046	100%	53,864	100%	10,924	88%	177,589	45%	15,502	20%	332	0%
0.05	43,692	100%	28,046	100%	53,625	99%	10,268	82%	130,573	33%	11,324	15%	87	0%
0.06	43,692	100%	28,046	100%	51,558	95%	10,174	82%	92,119	23%	7,401	10%	17	0%
0.07	43,692	100%	28,046	100%	44,933	83%	10,140	81%	68,288	17%	5,190	7%	3	0%
0.08	43,692	100%	28,046	100%	41,621	77%	10,103	81%	53,018	13%	4,031	5%	0	0%
0.09	43,692	100%	28,039	100%	37,764	70%	10,078	81%	40,730	10%	2,982	4%	0	0%
0.10	43,692	100%	27,798	99%	36,392	67%	10,052	81%	30,796	8%	2,359	3%	0	0%
0.15	43,692	100%	26,128	93%	32,788	61%	7,750	62%	9,485	2%	763	1%	0	0%
0.20	43,488	100%	24,134	86%	31,006	57%	4,824	39%	3,584	1%	239	0%	0	0%
0.25	41,993	96%	23,284	83%	29,485	55%	2,616	21%	1,468	0%	113	0%	0	0%
0.30	41,131	94%	22,537	80%	27,131	50%	1,084	9%	673	0%	70	0%	0	0%
0.35	40,313	92%	22,039	79%	22,965	43%	423	3%	337	0%	48	0%	0	0%
0.40	39,787	91%	20,898	75%	20,710	38%	357	3%	205	0%	28	0%	0	0%
0.47	39,217	90%	20,875	74%	16,229	30%	219	2%	95	0%	10	0%	0	0%
0.50	39,117	90%	20,868	74%	12,880	24%	194	2%	70	0%	7	0%	0	0%
0.60	36,951	85%	20,709	74%	6,685	12%	62	0%	33	0%	0	0%	0	0%
0.70	36,195	83%	19,607	70%	3,036	6%	45	0%	15	0%	0	0%	0	0%
0.80	36,149	83%	15,771	56%	1,291	2%	20	0%	11	0%	0	0%	0	0%
0.90	36,124	83%	12,526	45%	803	1%	14	0%	5	0%	0	0%	0	0%
1.00	35,948	82%	9,320	33%	622	1%	0	0%	4	0%	0	0%	0	0%
Total:	43,692	100%	28,046	100%	54,009	100%	12,455	100%	393,142	100%	77,655	100%	172,700	100%

Appendix M: Comparison of Gray Table 4, Model 1, with and without non-compensable WGN telecasts

Appendix M:

Table M: Comparison of the Gray Table 4 (Model 1) distant viewing estimates Model with both
compensable and non-compensable programs (Gray method)
versus model only including compensable programs

		WGN Compensable and non-Compensable Programs (Gray Model as-is)		Gray Model Limited to Only WGN Compensable Programs		Difference
		Distant Volume	Distant Share	Distant Volume	Distant Share	
2010	Com	408,952,826	14.29%	409,394,013	14.32%	-0.03%
2010	Dev	19,891,628	0.70%	16,606,789	0.58%	0.12%
2010	PS	2,072,970,364	72.45%	2,076,953,952	72.64%	-0.19%
2010	JSC	359,296,252	12.56%	356,347,149	12.46%	-0.10%
2011	Com	478,879,310	19.33%	479,760,457	19.39%	-0.06%
2011	Dev	15,093,367	0.61%	11,409,195	0.46%	0.15%
2011	PS	1,653,595,261	66.76%	1,653,077,287	66.82%	-0.06%
2011	JSC	329,468,823	13.30%	329,716,339	13.33%	-0.03%
2012	Com	507,971,105	19.62%	507,155,620	19.59%	0.03%
2012	Dev	6,010,719	0.23%	6,292,033	0.24%	-0.01%
2012	PS	1,765,281,244	68.17%	1,763,333,042	68.10%	0.07%
2012	JSC	310,276,623	11.98%	312,612,976	12.07%	-0.09%
2013	Com	465,585,659	18.72%	467,682,626	18.77%	-0.05%
2013	Dev	4,107,707	0.17%	4,158,508	0.17%	0.00%
2013	PS	1,749,411,436	70.35%	1,750,308,326	70.25%	0.10%
2013	JSC	267,691,019	10.76%	269,563,195	10.82%	-0.06%
2010-13	Com	1,861,388,900	17.87%	1,863,992,716	17.90%	-0.03%
2010-13	Dev	45,103,421	0.43%	38,466,526	0.37%	0.06%
2010-13	PS	7,241,258,305	69.53%	7,243,672,608	69.55%	-0.02%
2010-13	JSC	1,266,732,717	12.16%	1,268,239,660	12.18%	-0.02%

Appendix N: Details of Royalty Dollar Allocations for Cable (Basic Fund): Judge's Cable Premium Compared to Program Supliers

Details of Royalty Dollars Allocations for Cable (Basic Fund): Judge's Cable Premium Compared to PS

		cable		
category	Cable Volume Share (Crawford Fig. 12)	royalty allocation	royalty share multiplier (Same ratio as Gray's Premium)	Judge's Premium Comapred to PS
[1]	[2]	[3]	[4]= [3]/[2]	[5]
2010				
Can	6.0%	5.0%	0.83	
Pub TV	32.3%	14.8%	0.46	
BCG	14.7%	16.8%	1.14	1.65
Dev	3.2%	4.0%	1.25	1.81
PS	38.3%	26.5%	0.69	1.00
JSC	5.4%	32.9%	6.09	8.81
Total	**100%**	**100%**		
2011				
Can	6.2%	5.0%	0.81	
Pub TV	36.9%	18.6%	0.50	
BCG	15.7%	16.8%	1.07	1.51
Dev	2.3%	5.5%	2.39	3.37
PS	33.7%	23.9%	0.71	1.00
JSC	5.2%	30.2%	5.81	8.19
Total	**100%**	**100%**		
2012				
Can	7.0%	5.0%	0.71	
Pub TV	36.6%	17.9%	0.49	
BCG	16.5%	16.2%	0.98	1.46
Dev	1.8%	5.5%	3.06	4.53
PS	31.9%	21.5%	0.67	1.00
JSC	6.2%	33.9%	5.47	8.11
Total	**100%**	**100%**		
2013				
Can	7.6%	5.5%	0.72	
Pub TV	39.7%	19.5%	0.49	
BCG	15.6%	15.3%	0.98	1.46
Dev	1.6%	4.3%	2.69	4.00
PS	28.7%	19.3%	0.67	1.00
JSC	6.7%	36.1%	5.39	8.01
Total	**100%**	**100%**		
2010-2013				
BCG				1.52
Dev				3.43
PS				1.00
JSC				8.28
Total				

Source [3]: Table 1 of "Final allocation determination - as published.pdf" (Federal Regsiter Vol 84 No 29 Feb 12 2019)

Appendix O: Dr. Gray's Alternative Distant Viewing Estimates

Appendix O: Dr. Gray's Alternative Distant Viewing Estimates

1.   Dr. Gray opines that "the most reliable estimates of the relative market value" are his Table 4 Model 1[1] estimates. Dr. Gray presents other analyses that he describes as inferior estimates including: Table 4 Model 2, Table 4 Model 3[2], and Appendix E shares based on total viewing regressions.[3]

2.   All of Gray's alternative models suffer from the same problems as his preferred model. They are based on the Lindstrom NPM data that is not designed to and cannot reliably measure distant viewing, and Dr. Gray's regression cannot solve the underlying problems with the data. We incorporate by reference the problems discussed above.

Gray Alternative Distant Viewing Estimates: Gray Table 4, Model 2

3.   Model 2 is the same as Model 1 except Dr. Gray excludes 92.8 percent (=10,049,730/ [10,049,730+781,821]) of the data used in Model 1 regression analysis that has no Lindstrom viewing data. In addition to the problems described above, this change causes many of the Gray model estimates to be greater than the number of distant subscribers.

4.   Among numerous other problems, Dr. Gray's Table 4 Model 2 estimated that the paid programming distant viewing share of compensable programming was 7.27 percent (2010-2013). This large share allocated to paid programming is particularly surprising given that in this same analysis, Dr. Gray estimates that the distant viewing share of compensable programming was only 4.4 percent for JSC and 0.89 percent for Devotional. That is, Dr. Gray estimates that the

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[1] "Model 1 is my preferred approach", Gray Testimony ¶64.
[2] Model 3 "is an inferior approach", Gray Testimony ¶69.
[3] This is only mentioned in the Gray testimony in footnote 24 and Appendix E.

Program Suppliers paid programming share (7.27%) is 65 percent larger than JSC (65% = 6.2%/4.4% -1) and larger than both JSC and devotional combined (7.27% vs. 5.3 = 4.4% +0.89%).

        5.   Figure 1 illustrates a fundamental fatal flaw in the Gray Table 4 Model 2 viewing methodology — it is biased and will inflate the distant viewing estimates of smaller stations as compared to larger stations. This figure shows Dr. Gray's average estimated distant viewing (based on his Model 2 viewing methodology). The Gray model estimates are unreliable and untrustworthy because the majority of the stations have an average distant viewing that is larger than their number of distant subscribers.

Figure 1: Average Gray Estimated Distant Viewing Households for Model 2
Divided by Distant Subscribers (2010)
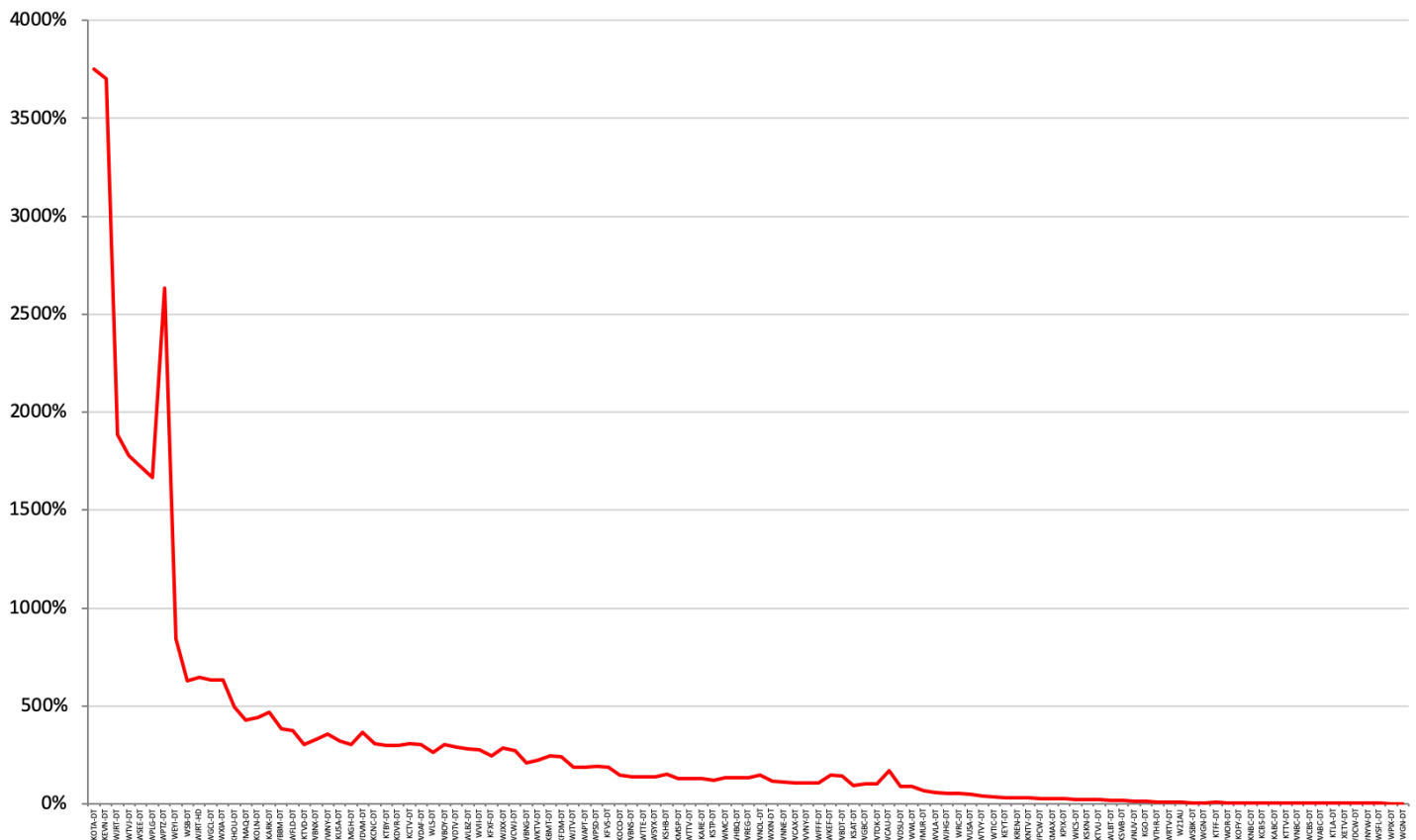
        6.   Figure 2 is the same as Figure 1 except it shows the maximum estimated distant viewing. This figure also illustrates a fundamental fatal flaw in the Gray Table 4 Model 2 viewing

methodology. This figure shows Dr. Gray's maximum estimated distant viewing (based on his Model 2 viewing methodology). The Gray model estimates are unreliable and untrustworthy because the majority of the stations have an average distant viewing that is larger than their number of distant subscribers.

Figure 2: Maximum Gray Estimated Distant Viewing Households for Model 2
Divided by Distant Subscribers (2010)

7.   Dr. Gray opines that "[d]ifferences between the enhanced viewing estimates of Model 1 and Model 2 demonstrate the importance of instances of non-recorded viewing in the Nielsen data."[4] This argument does not hold water. Neither Gray Model 1 nor Model 2 provide reliable or valid estimates of distant viewing — the fact that these different Gray approaches give

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[4] Gray Testimony ¶66.

different results does not teach us that one model is superior to another. On the contrary, this divergence of Gray estimates only highlights that his distant viewing estimates are highly variable, dependent on Dr. Gray's unsupported assumptions and improperly use the Lindstrom NPM data.

Gray Alternative Distant Viewing Estimates: Gray Table 4, Model 3

8.   Model 3 is the same as Model 1 except whereas Model 1 only uses the estimated distant viewing from the Gray model his Model 3 replaces the Model 1 estimates with the actual raw Lindstrom viewing data from the records. Model 3 replaces about 7.2 percent (=781,821/ [10,049,730+781,821]) of the Model 1 estimates with the raw Lindstrom distant viewing data. Dr. Gray also states that the "viewing metrics are similar using Models 1 and 3" but this only emphasizes that the Gray model simply echoes the distant viewing shares found in the raw Lindstrom distant viewing data.

9.   The Gray Table 4, Model 3 has the same problems as his other viewing models, including that distant viewing estimates are frequently impossibly large because they estimate that there are more distant viewers than there are distant subscribers. Figure 3 illustrates a fundamental fatal flaw in the Gray Table 4 Model 3 viewing methodology — it is biased and will inflate the distant viewing estimates of smaller stations as compared to larger stations. This figure shows Dr. Gray's maximum estimated distant viewing (based on his Model 3 viewing methodology). The Gray model estimates are unreliable and untrustworthy because the majority of the stations have an average distant viewing that is larger than their number of distant subscribers.

Figure 3: Maximum Gray Estimated Distant Viewing Households from Model 3
Divided by Distant Subscribers (2010)

***Gray Alternative Distant Viewing Estimates: Gray Appendix E Total Viewing
Regression (Model 4)***

10.   Dr. Gray does not discuss his total viewing regression (Model 4) analysis in the text

of his testimony. The Gray testimony only mentions Model 4 in footnote 24 and in Appendix E.

The full text of footnote 24 (and the model discussion of total viewing regression Model 4) is:

> In addition to enhanced viewing estimates based on these three models,
> Appendix E presents viewing estimates relying on total viewing. That is,
> regressions analyzed local and distant viewing combined. This provides an
> alternative measure of viewing that captures when households tend to be
> watching television based on the quarter hour of the day.

11.   Dr. Gray does not describe this analysis except to say the regression analysis uses

"local and distant viewing combined". We have reviewed the Gray computer code and find that

there are five major differences between the Gray Table 4 regressions and his total viewing regression (Model 4). Specifically, Model 4

- Includes the sum of local and distant viewing as the dependent variable in the regression,
- Groups together WGN and non-WGN records in the same regression;
- Uses only two independent variables (time of day and program type) and exclude the subscriber variable;
- Uses a linear regression instead of a Poisson regression methodology;
- Uses an unweighted regression instead of a weighted (via minutes) regression analysis

12. This Gray regression model which has only two independent variables (i.e., time of day and program type) and includes local viewing in addition to distant viewing will provide no reliable or trustworthy estimates relative to this case.

13. There are many examples where the Gray Model 4 estimates that there was negative total viewing — this Gray estimate is impossible. For example, in 2011 there are, on average, 31.5 million distant subscribers and some unknown number of local subscribers that are potentially watching a program. Dr. Gray's model purports to estimate the total number of viewers among these many millions of subscribers. Yet, the Gray Model 4, estimates that for every day of the year in 2011 the total viewing at 4:30 am is negative for 13 program types (see Table 1).

Table 1: Dr. Gray Model 4 Total Viewing Estimates
4:30am for Each Day in 2011

Program Type	Gray Total Daily Viewing Estimate
Cartoons	-7,934
CHILDREN'S SHOW	-7,543
CHILDREN'S SPECIAL	-3,595
FINANCE	-2,021
FIRST-RUN SYNDICATION	-3,728
HOBBIES & CRAFTS	-2,611
MINI-SERIES	-7,541
MOVIE	-3,593
OTHER	-2,923
RELIGIOUS	-2,236
SPORTING EVENT	-140
SPORTS ANTHOLOGY	-4,168
TV MOVIE	-2,187

14. The fact that Dr. Gray's Model 4 frequently estimates negative viewing (among more than 31.5 million subscribers) is sufficient to demonstrate that these estimates are unreliable. See Appendix I for the details of the Gray Model 4.

15. Dr. Gray's model also estimates that WGN in 2011 (with 22 million distant subscribers and some unknown number of local subscribers) has less total viewing that KTOA in 2011 (with only 316 average distant subscribers and some unknown number of local subscribers). This Gray estimate occurs because the Gray total viewing model does nothing to distinguish between stations nor does he consider the number of distant or local subscribers for particular stations when he makes his model predictions.

Appendix P: 2010-13 Satellite Royalty Allocations Based Upon the 2010-13 Bortz Survey Results

Appendix P:
2010-13 Satellite Royalty Allocations Based Upon the 2010-13 Bortz Survey Results

In Table 7 of our written direct testimony, we applied the Judges' decision in the 2010-13 Cable Final Determination as a benchmark for distributing the 2010-13 satellite royalty funds. Table P1 recalculates that benchmark using Table I-1 of the 2010-13 Bortz Report (JSC Ex. 7) for the cable royalty allocation instead of the 2010-13 Cable Final Determination.

Table P1: Benchmark Recalculated Using Bortz Table I-1 (JSC Ex. 7)[3]

Agreed Category	2010	2011	2012	2013	2010-13
CTV	20.6%	17.3%	24.0%	23.3%	**21.2%**
Devotionals	1.5%	2.1%	2.5%	2.8%	**2.2%**
Program Suppliers	39.6%	45.3%	32.7%	33.1%	**37.9%**
JSC	38.3%	35.3%	40.7%	40.9%	**38.7%**
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Table P1 accounts for the differing volumes of programming in each Agreed Category carried on Section 111 and Section 119 signals. Table P2 below rescales Table I-1 of the Bortz Report (JSC Ex. 7) by backing out the Public Television and Canadian Claimants Group's shares but does not take into account relative shares of program volume Section 111 or Section 119 signals.

Table P2: Bortz Table I-1 (JSC Ex. 7) Rescaled for no Canadian nor Public TV

	2010	2011	2012	2013	2010-13
BCG	19.6%	19.2%	24.2%	24.5%	21.8%
Dev	4.2%	4.7%	5.1%	5.4%	4.8%
PS	33.4%	37.8%	30.5%	29.4%	32.9%
JSC	42.8%	38.2%	40.2%	40.7%	40.5%
Total	100%	100%	100%	100%	100%

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[3] See electronic file "Bortz.xlsx" for Tables P1 and P2.

Appendix R: Figures showing ratios of maximum and average Gray predicted distant viewing households divided by distant subscribers for every station 2010-2013
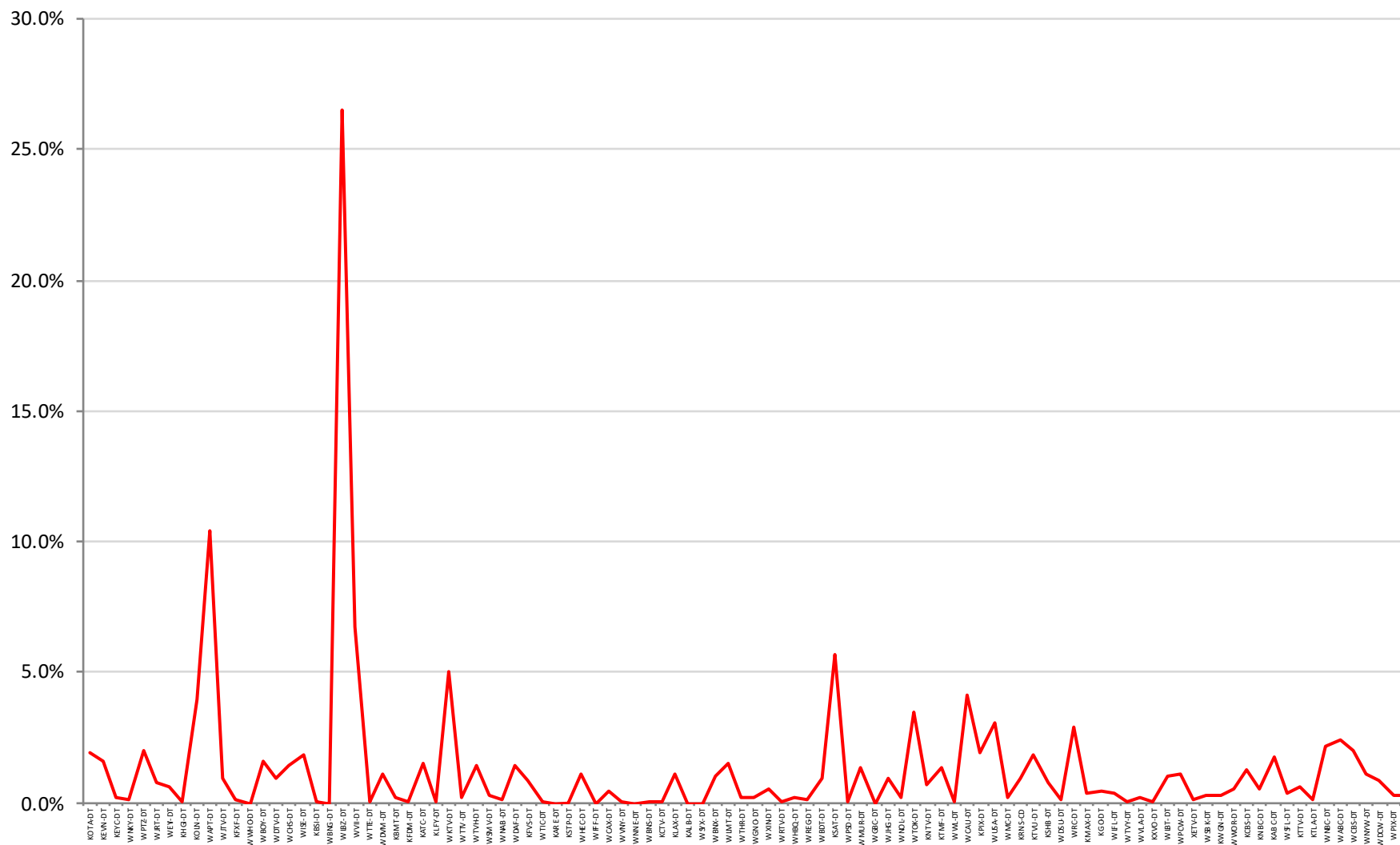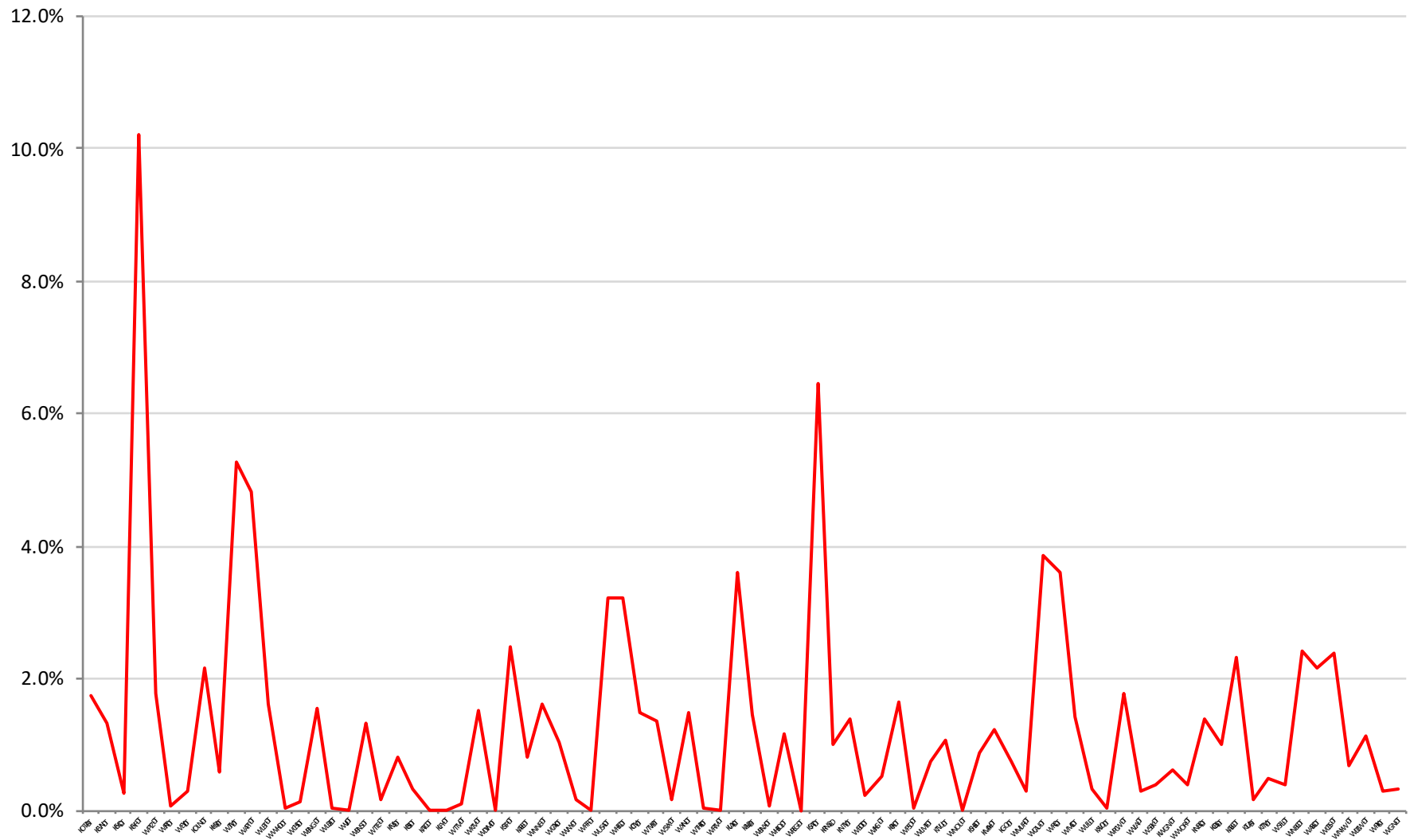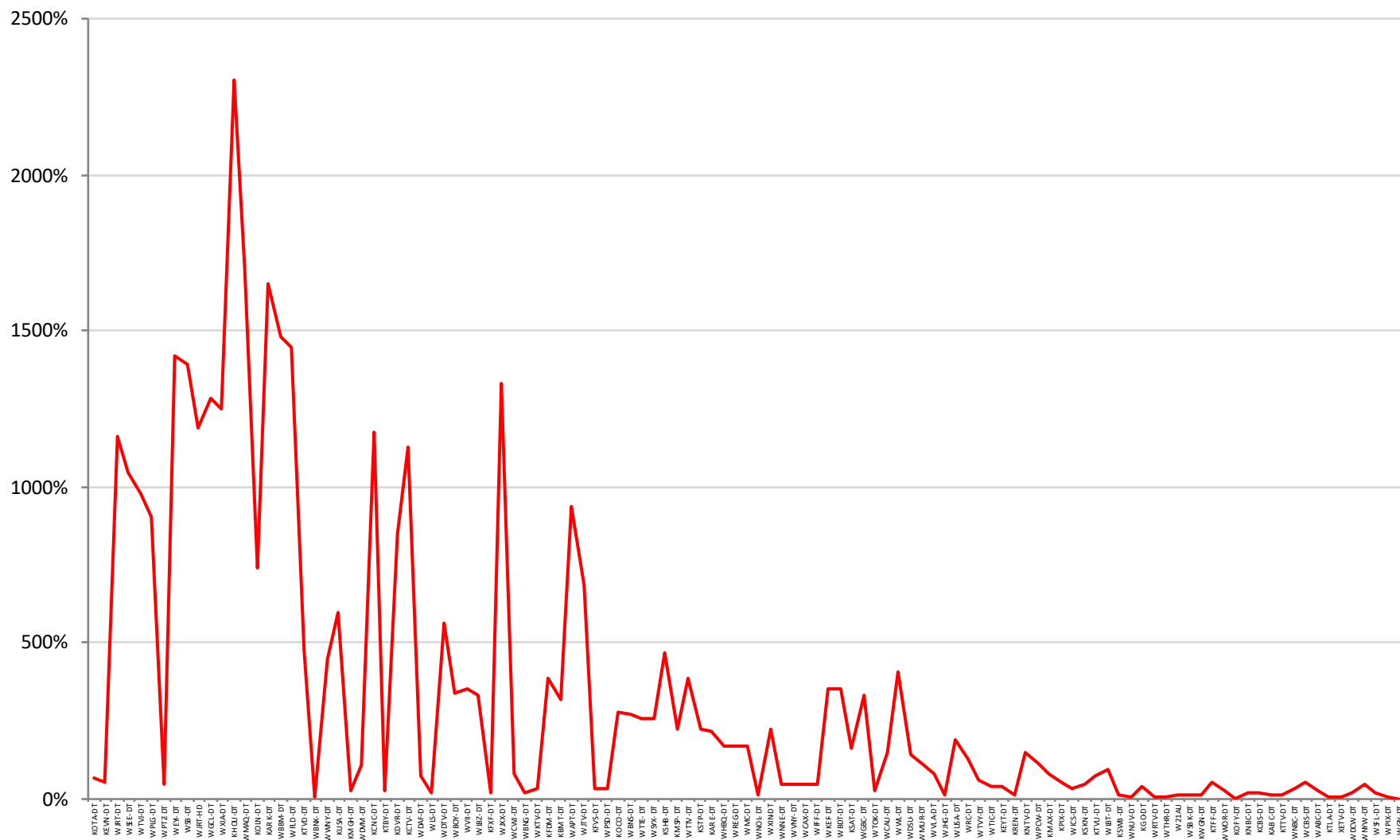
Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2010): Model 1
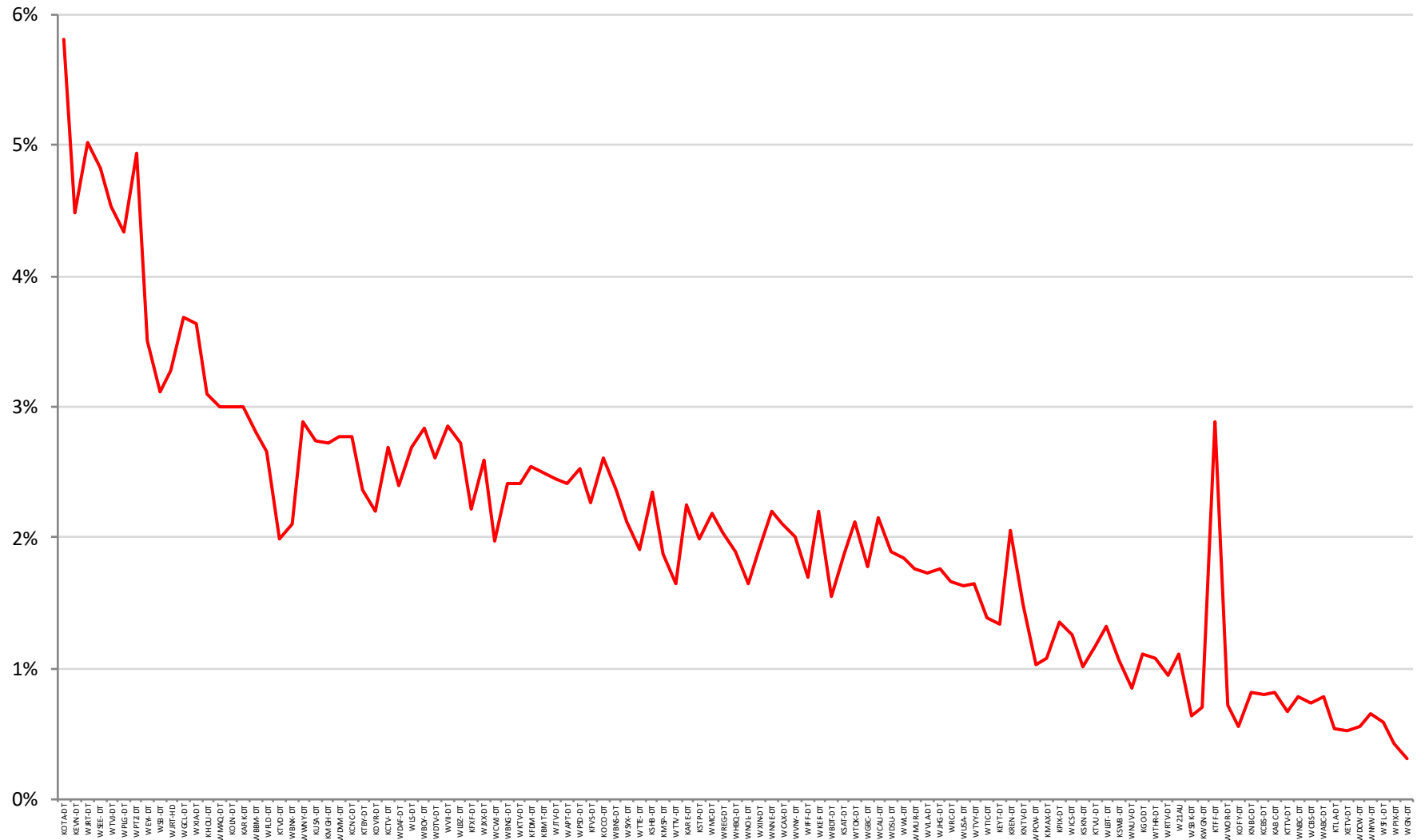
Average Gray Estimated Distant Viewing Households
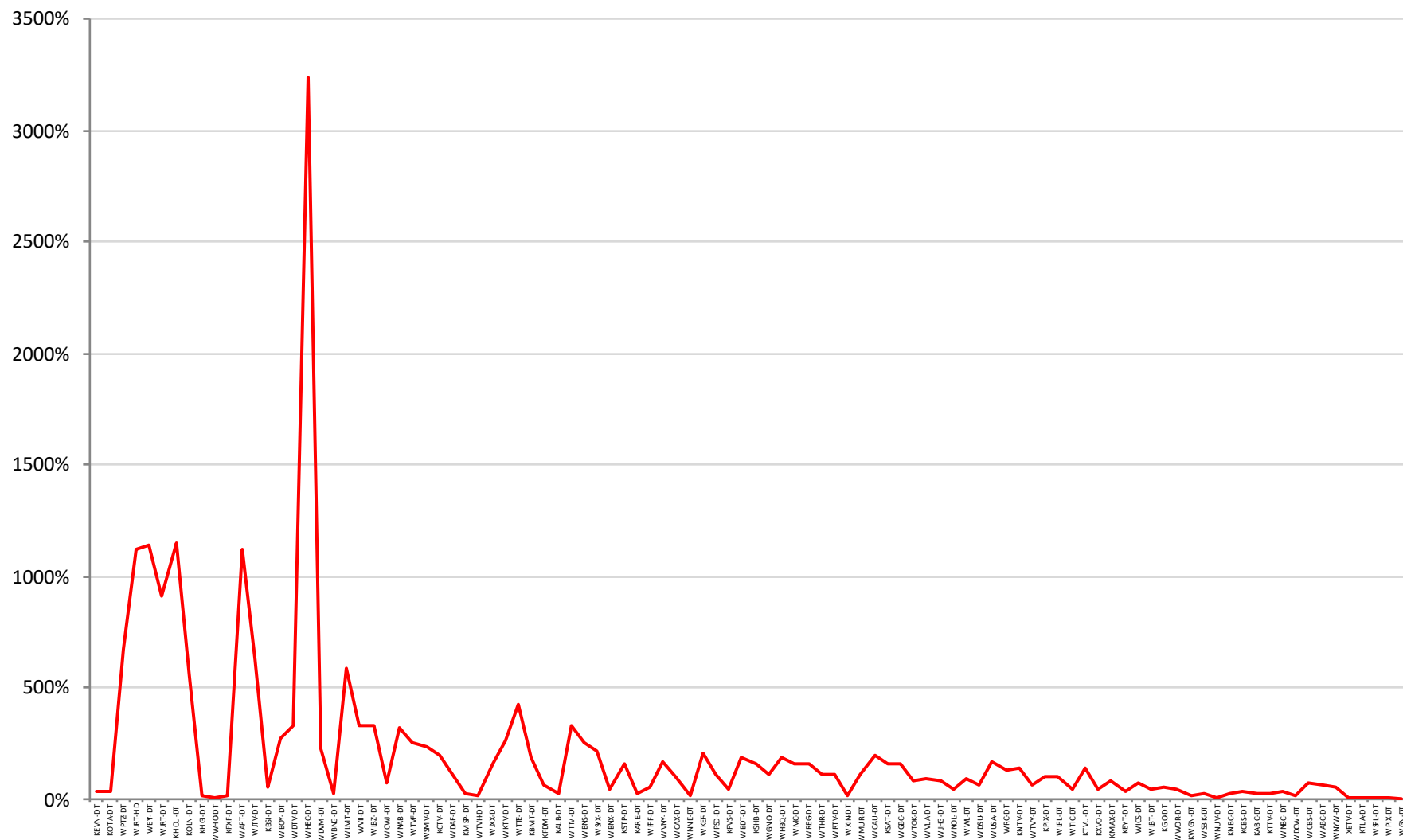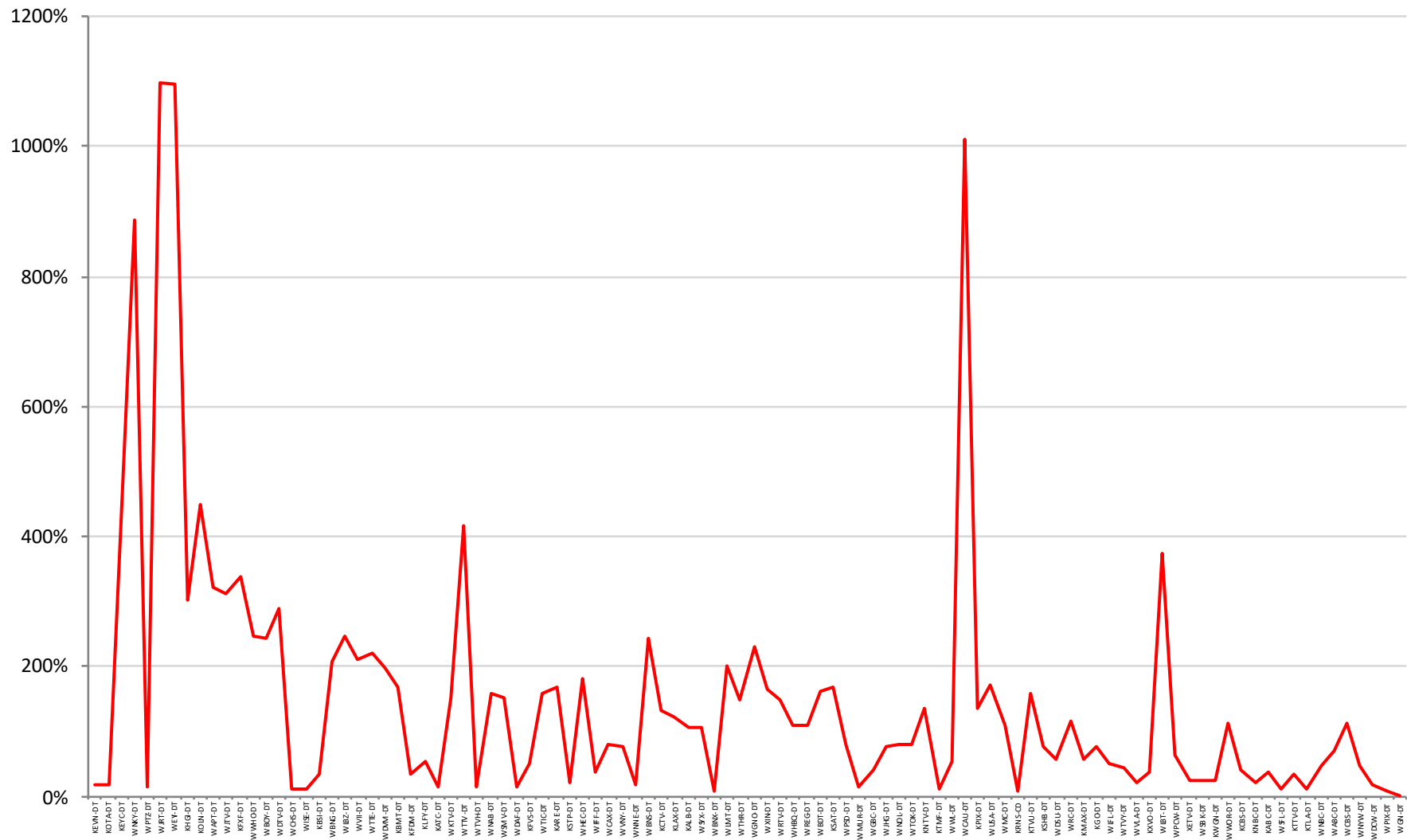## Divided by Distant Subscribers (2011): Model 1
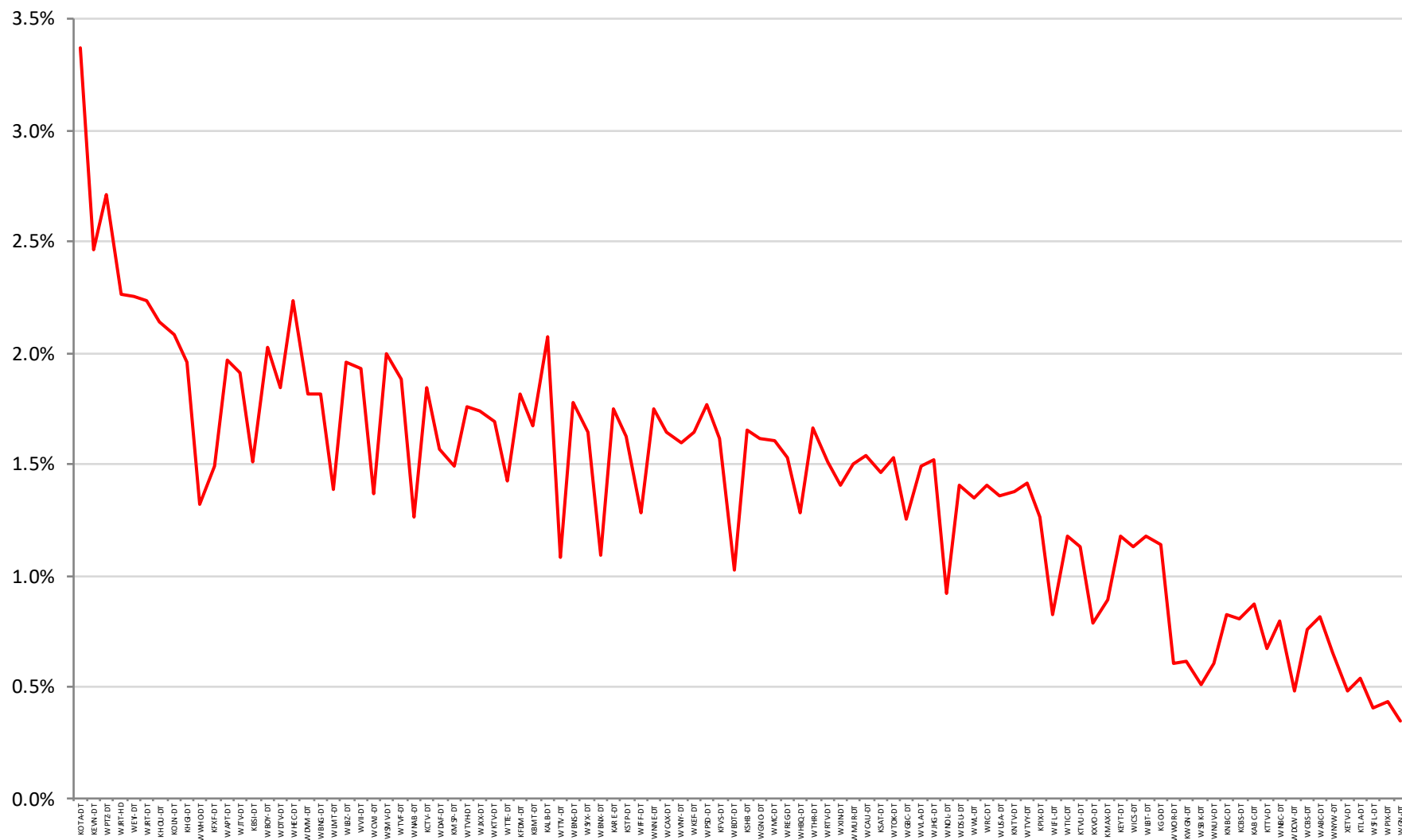
Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2012): Model 1
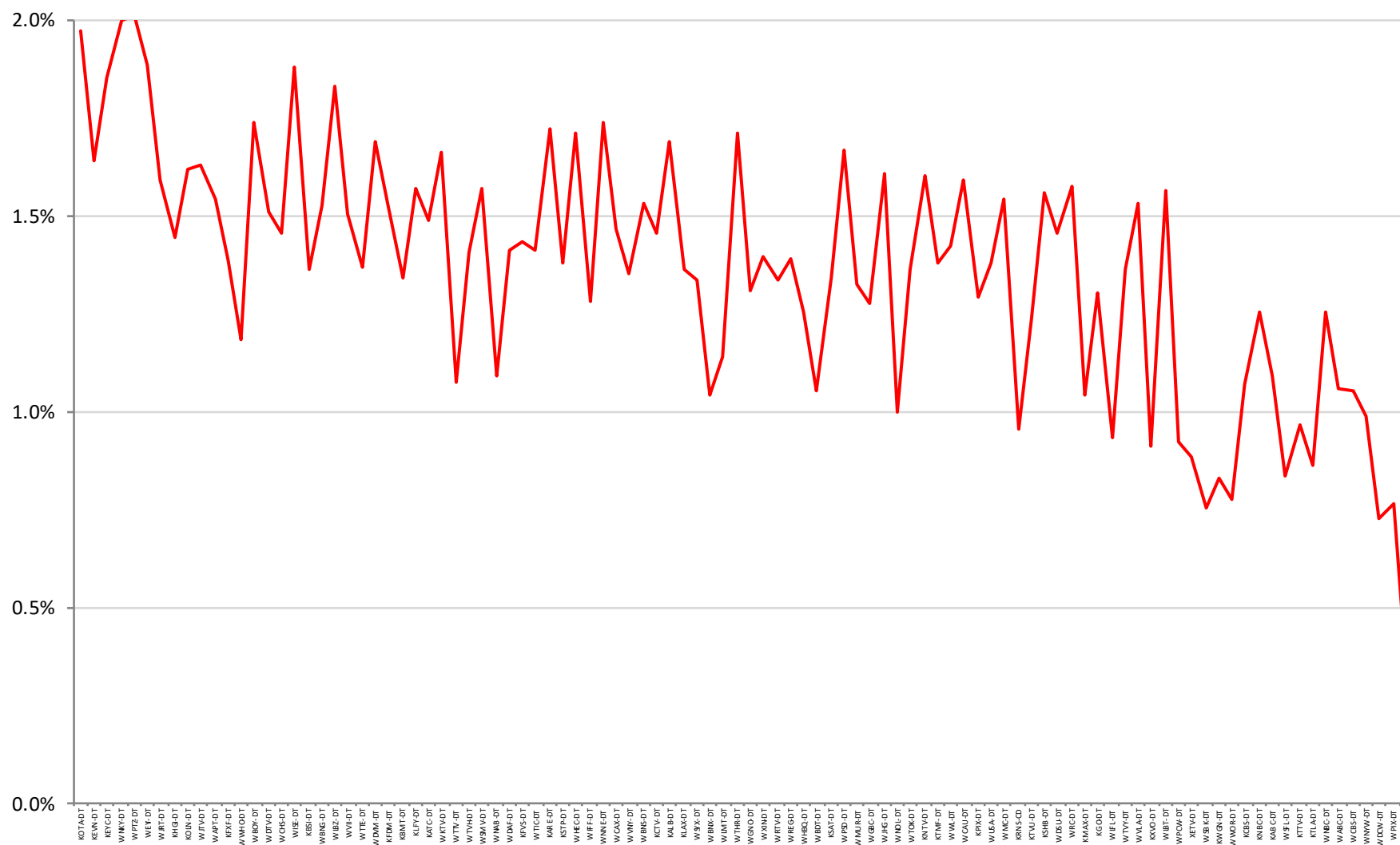
Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2013): Model 1
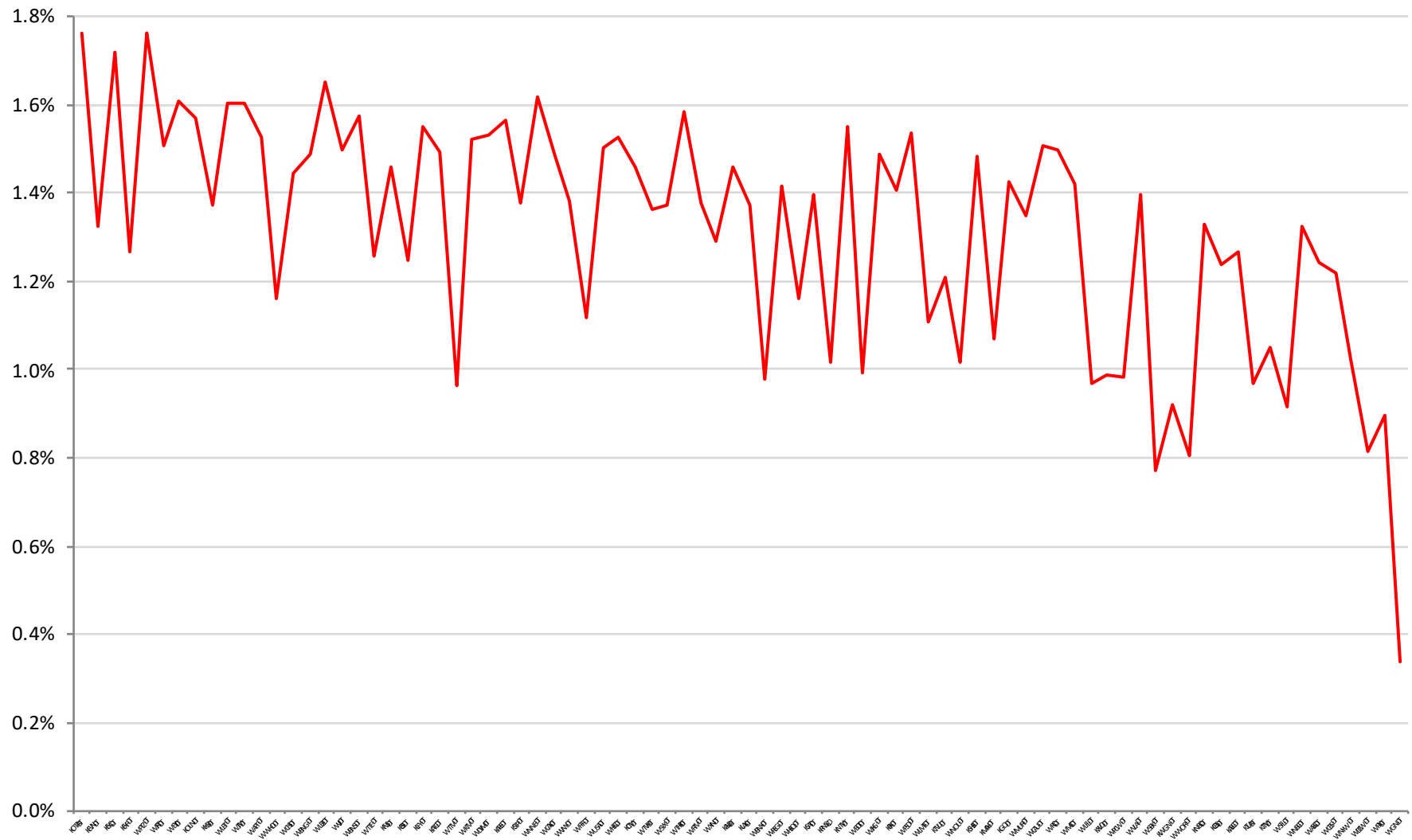
Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2010): Model 1
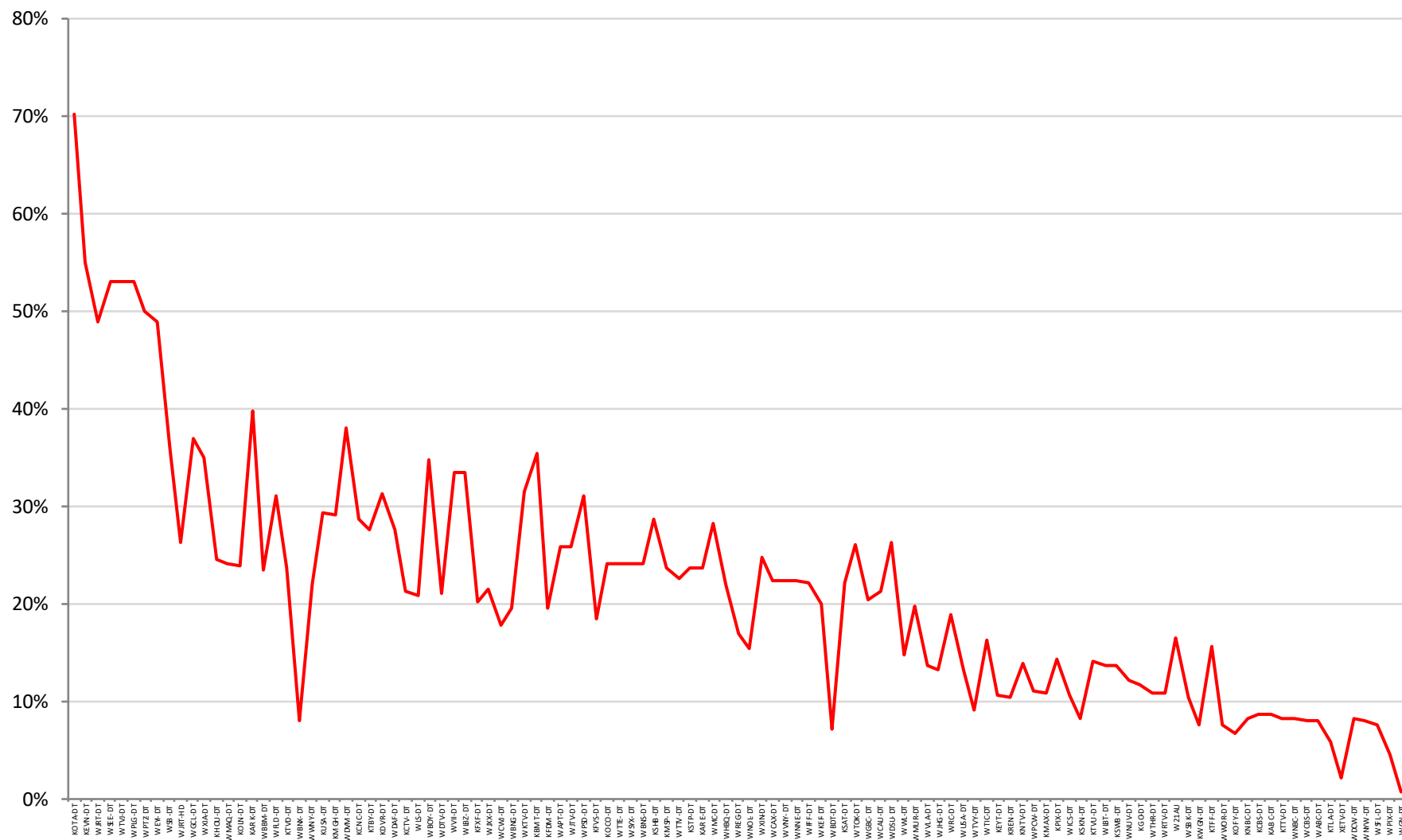
Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2011): Model 1

Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2012): Model 1
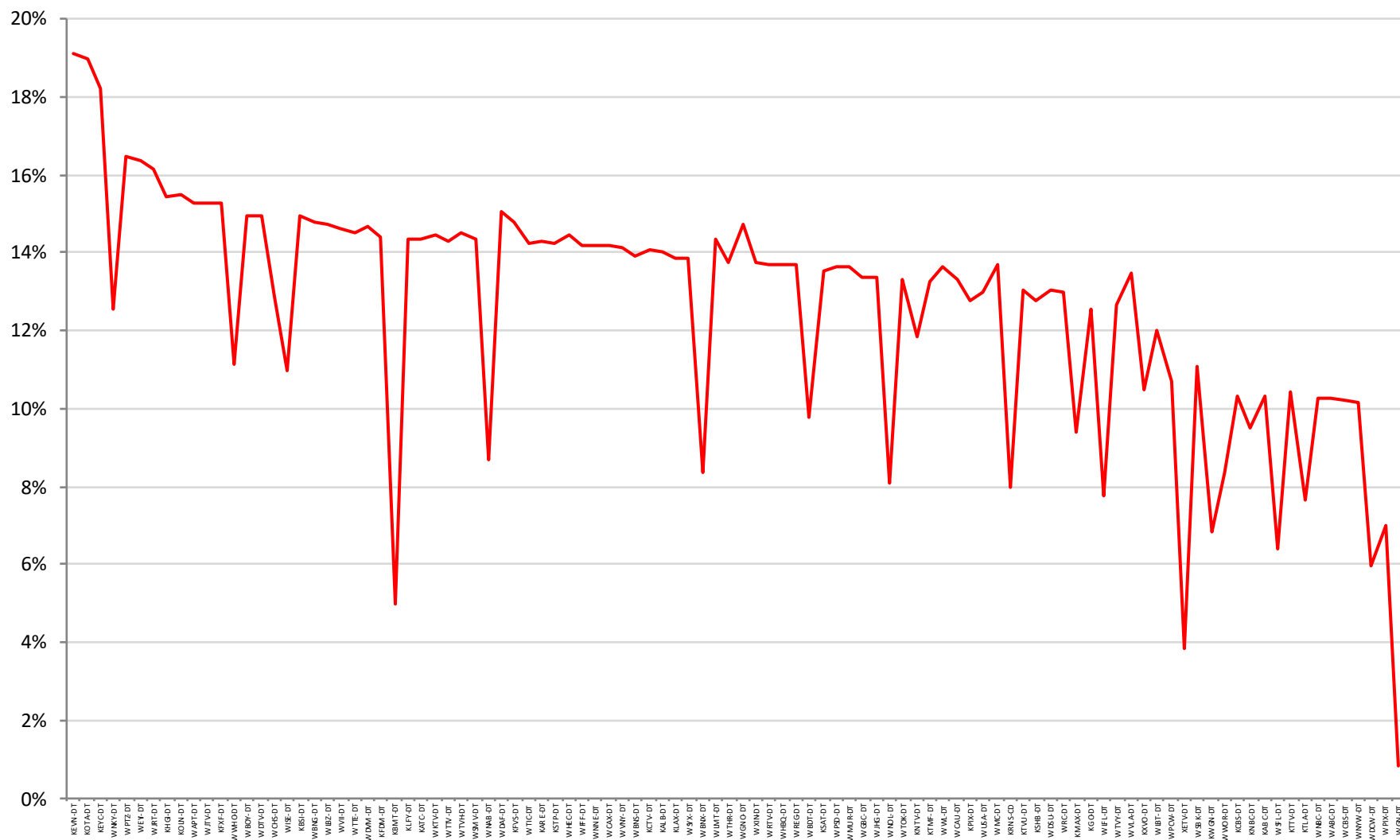
Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2013): Model 1

Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2010): Model 2
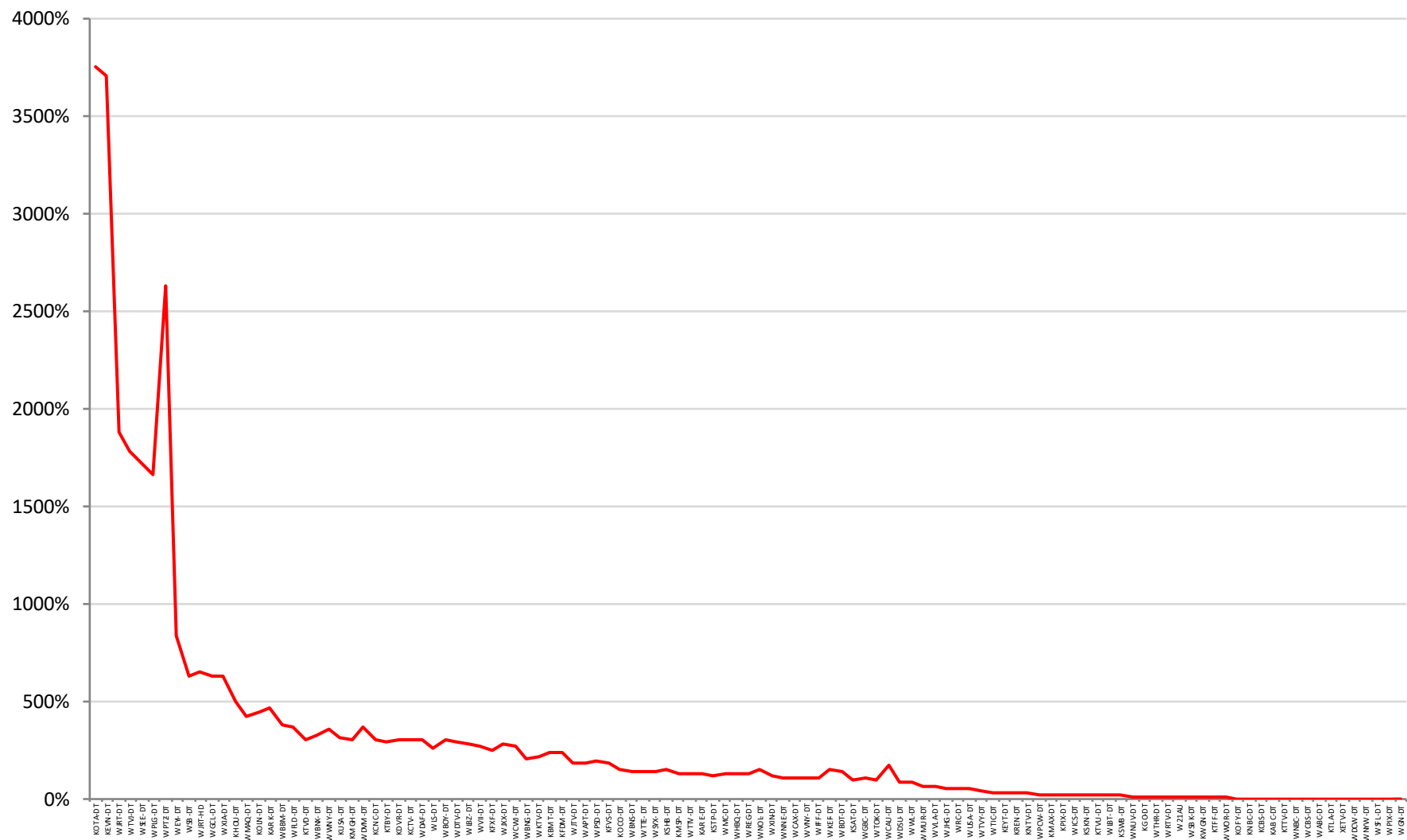
Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2011): Model 2
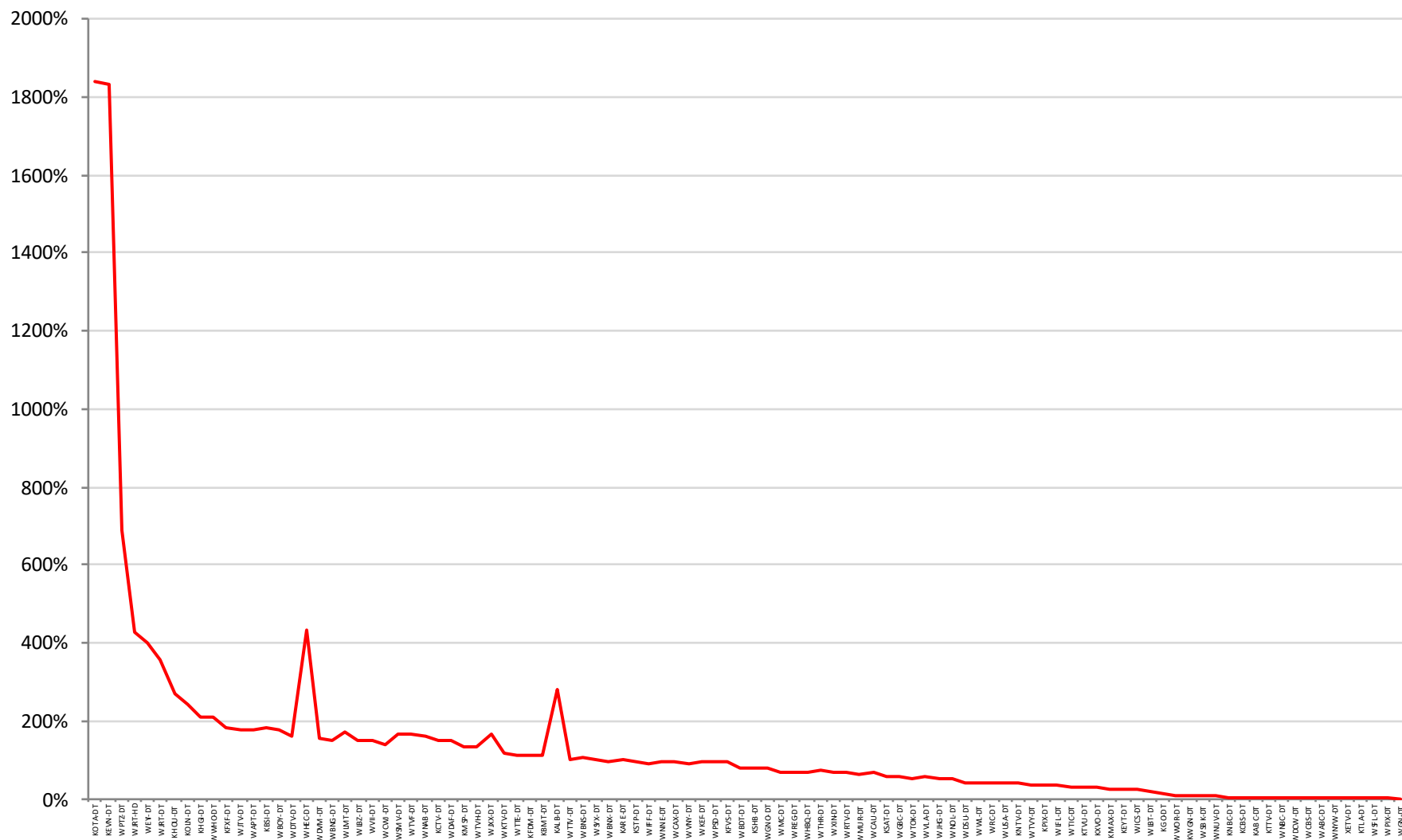
Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2012): Model 2
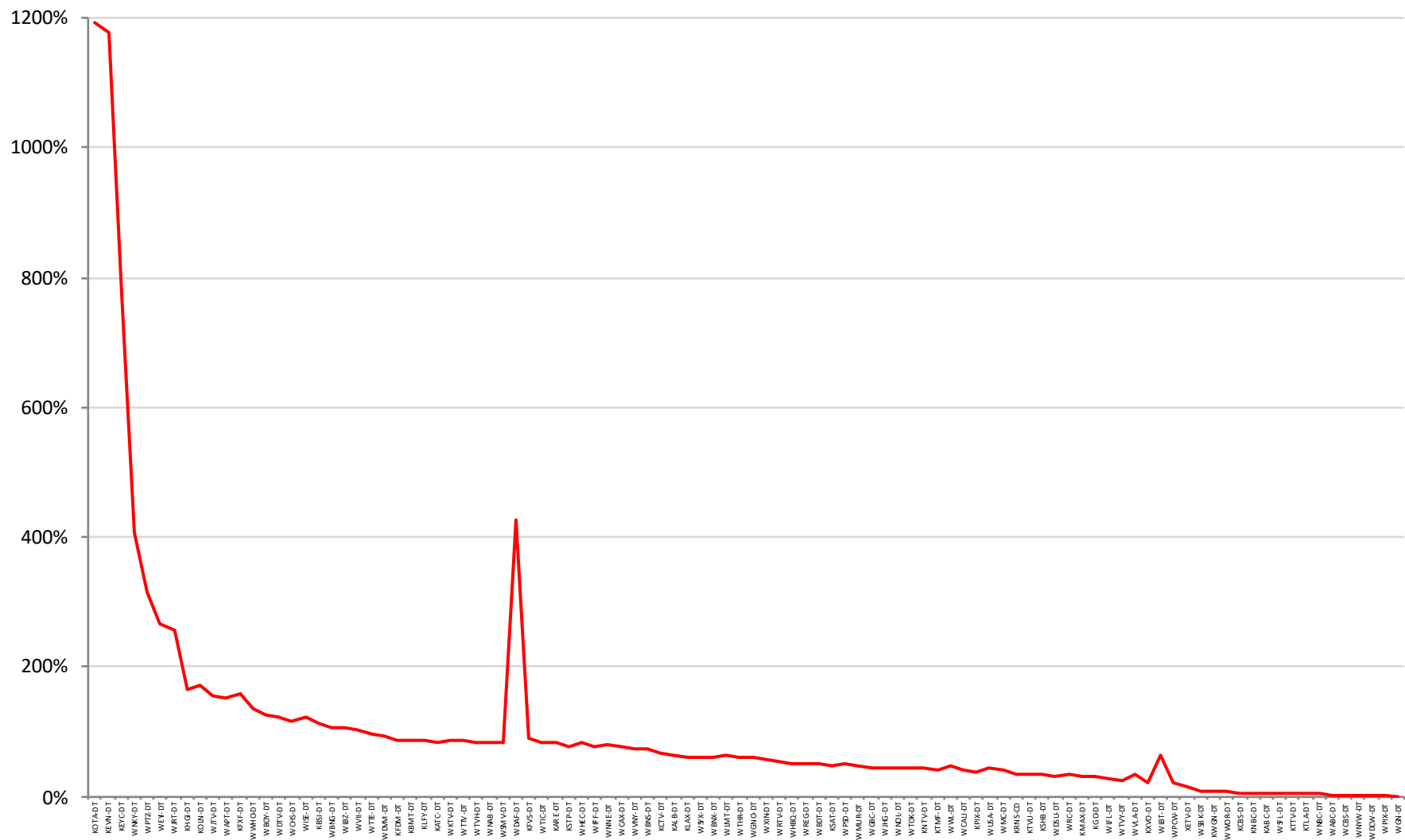
**Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2013): Model 2**
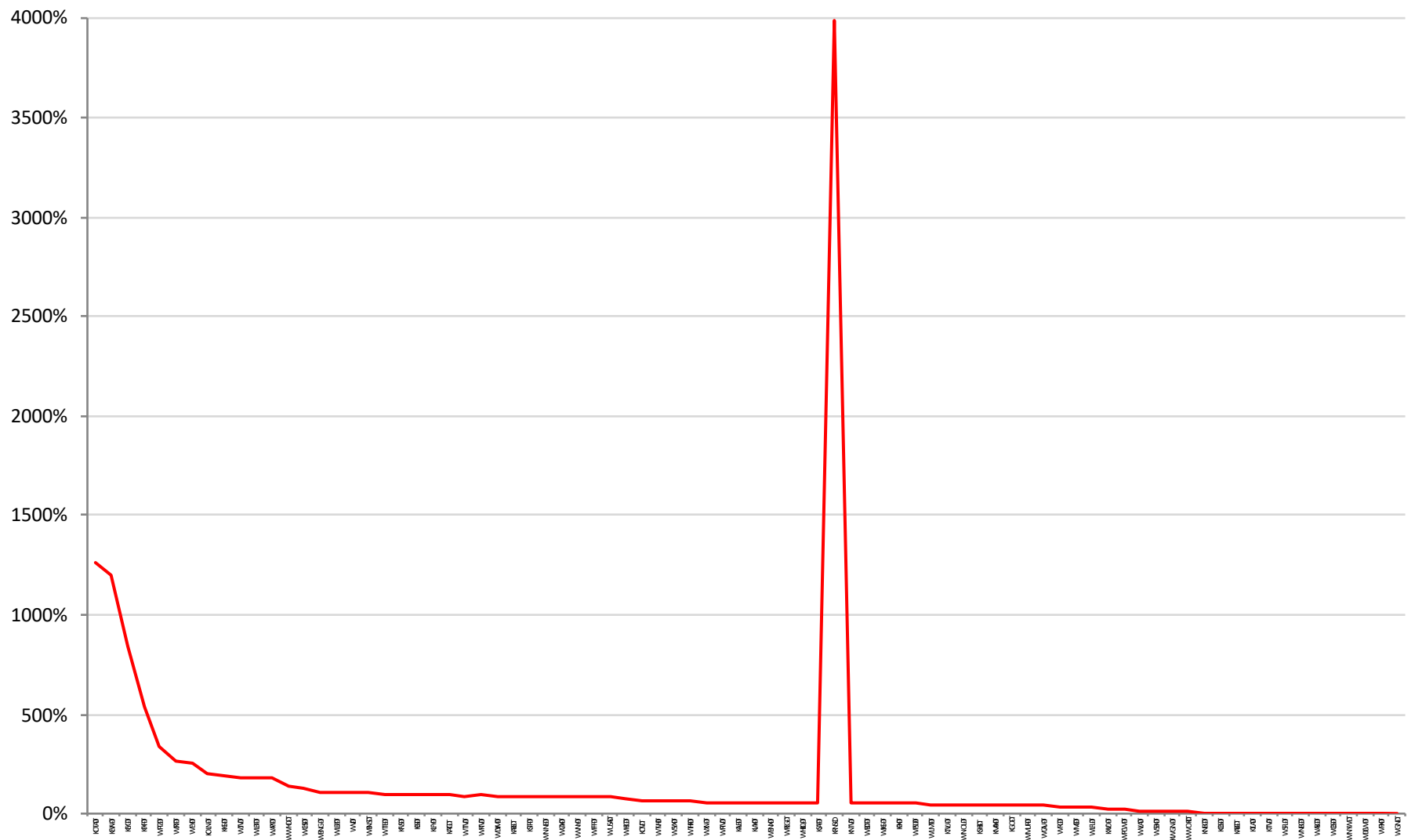
Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2010): Model 2
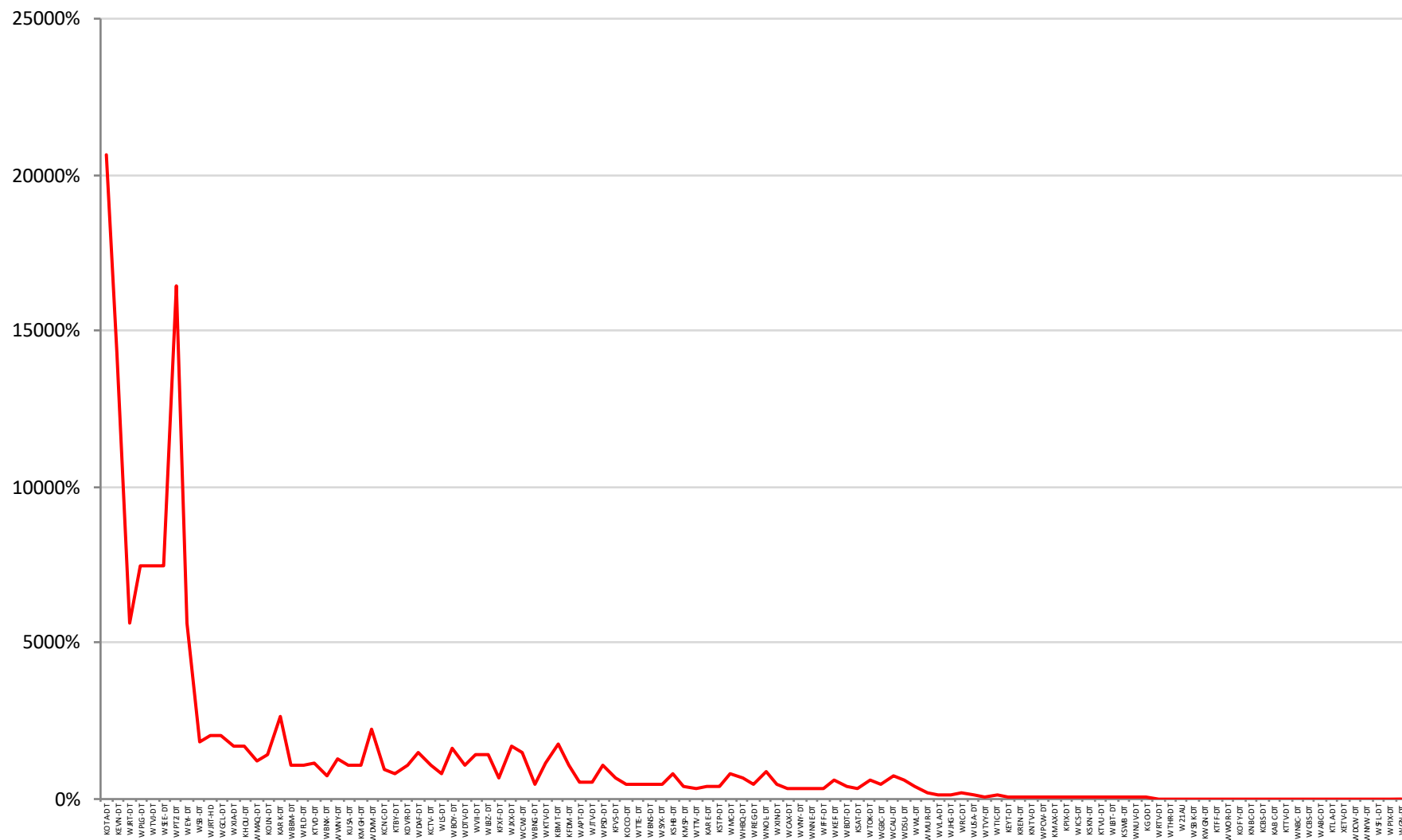
Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2011): Model 2
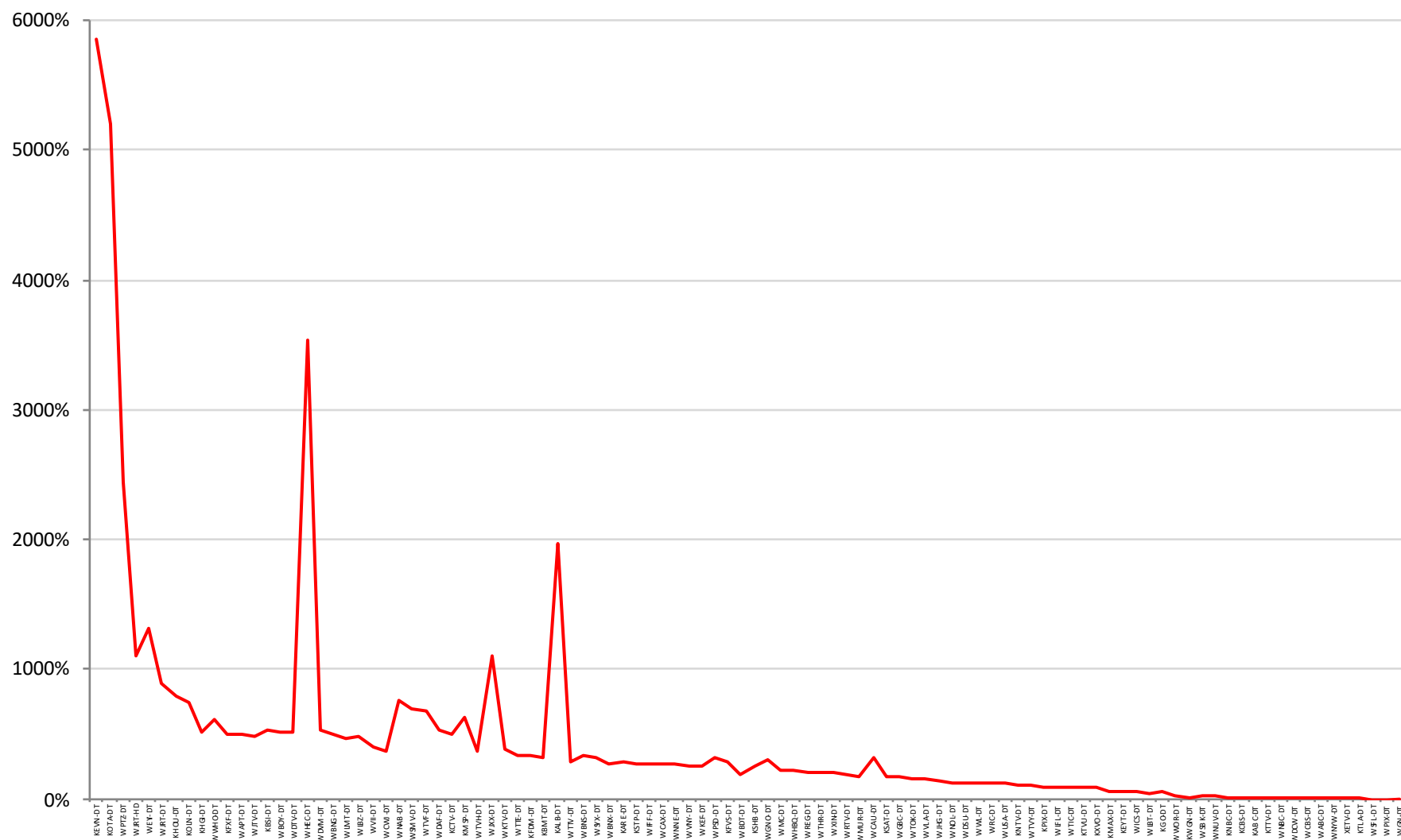
Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2012): Model 2
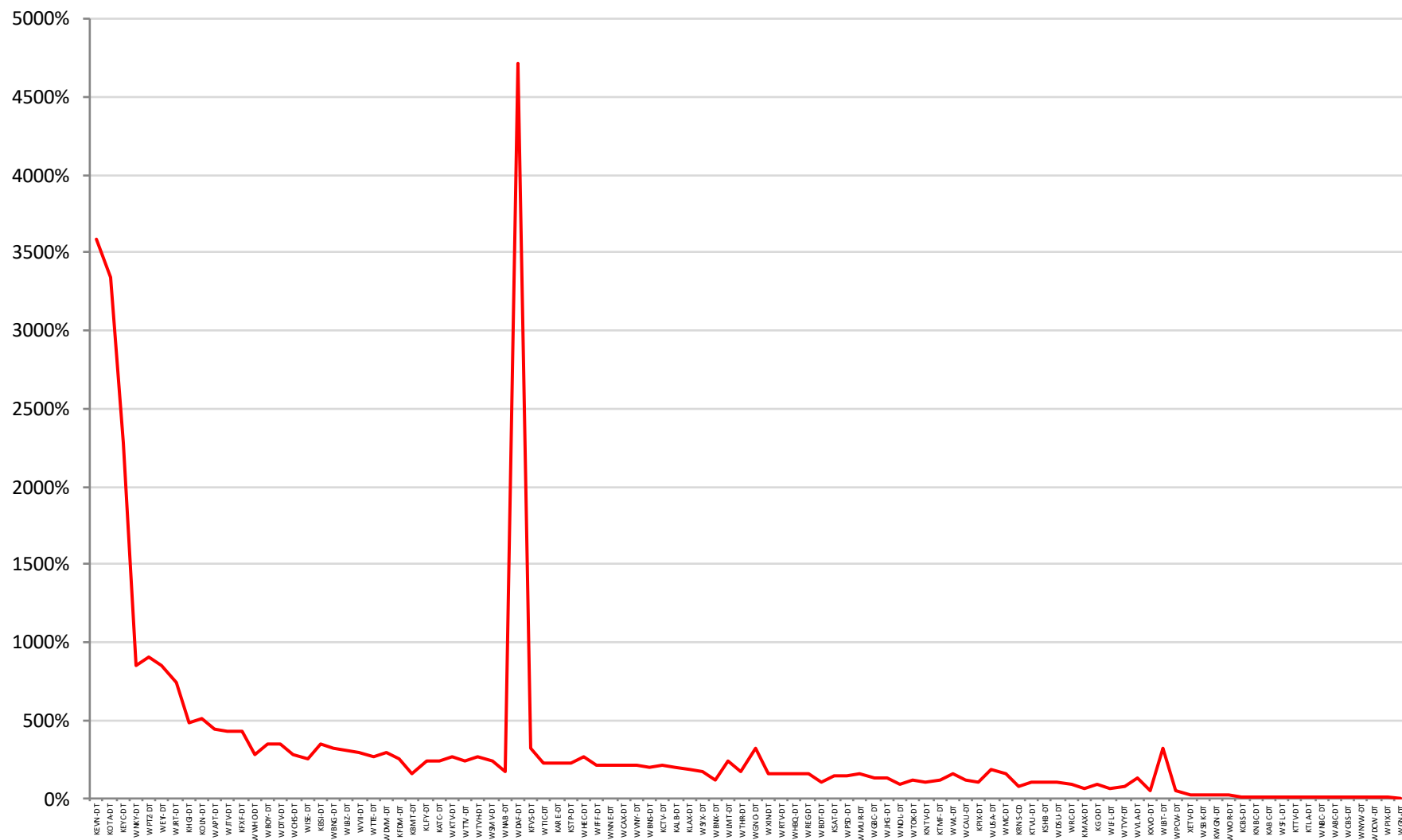
Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2013): Model 2
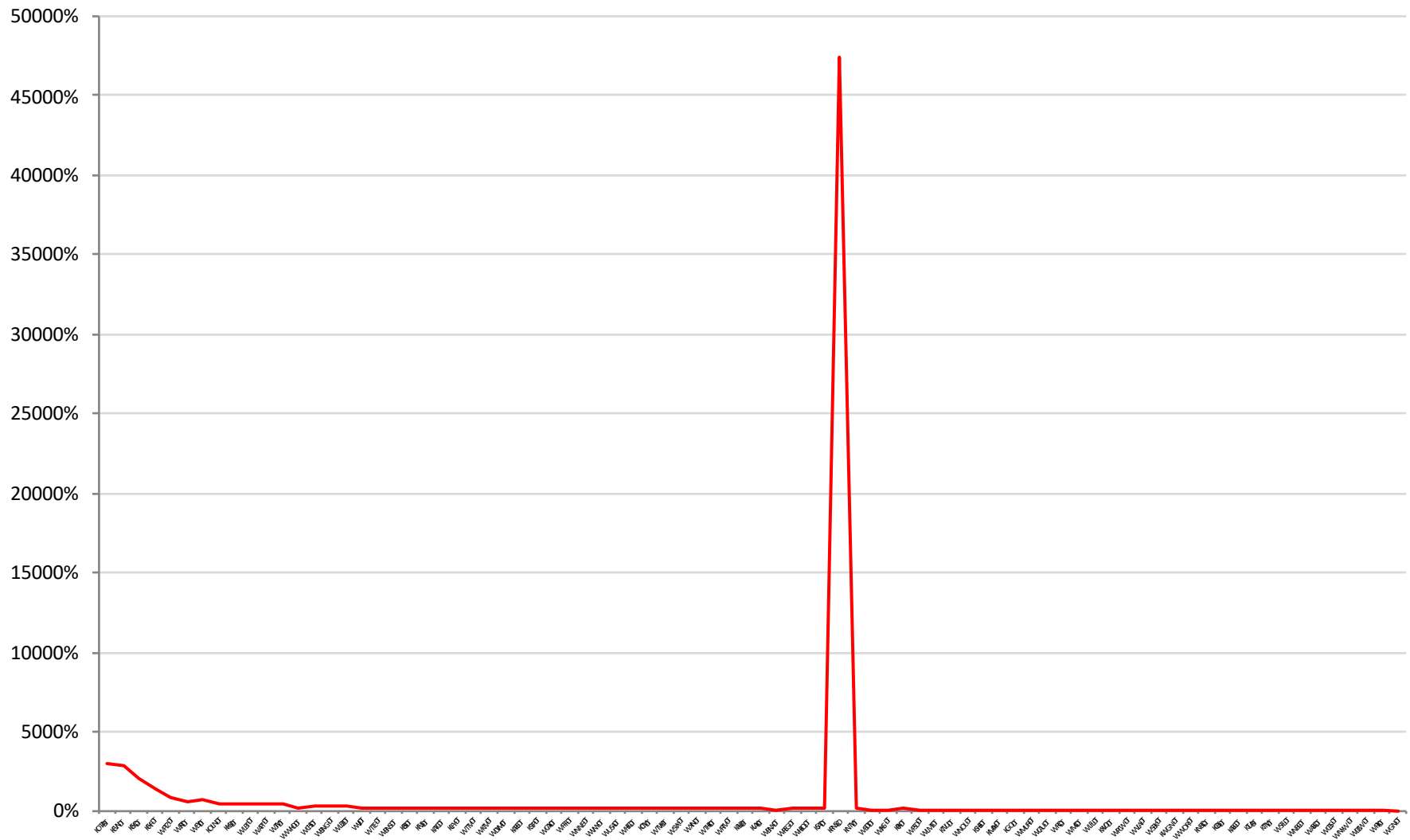
Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2010): Model 3
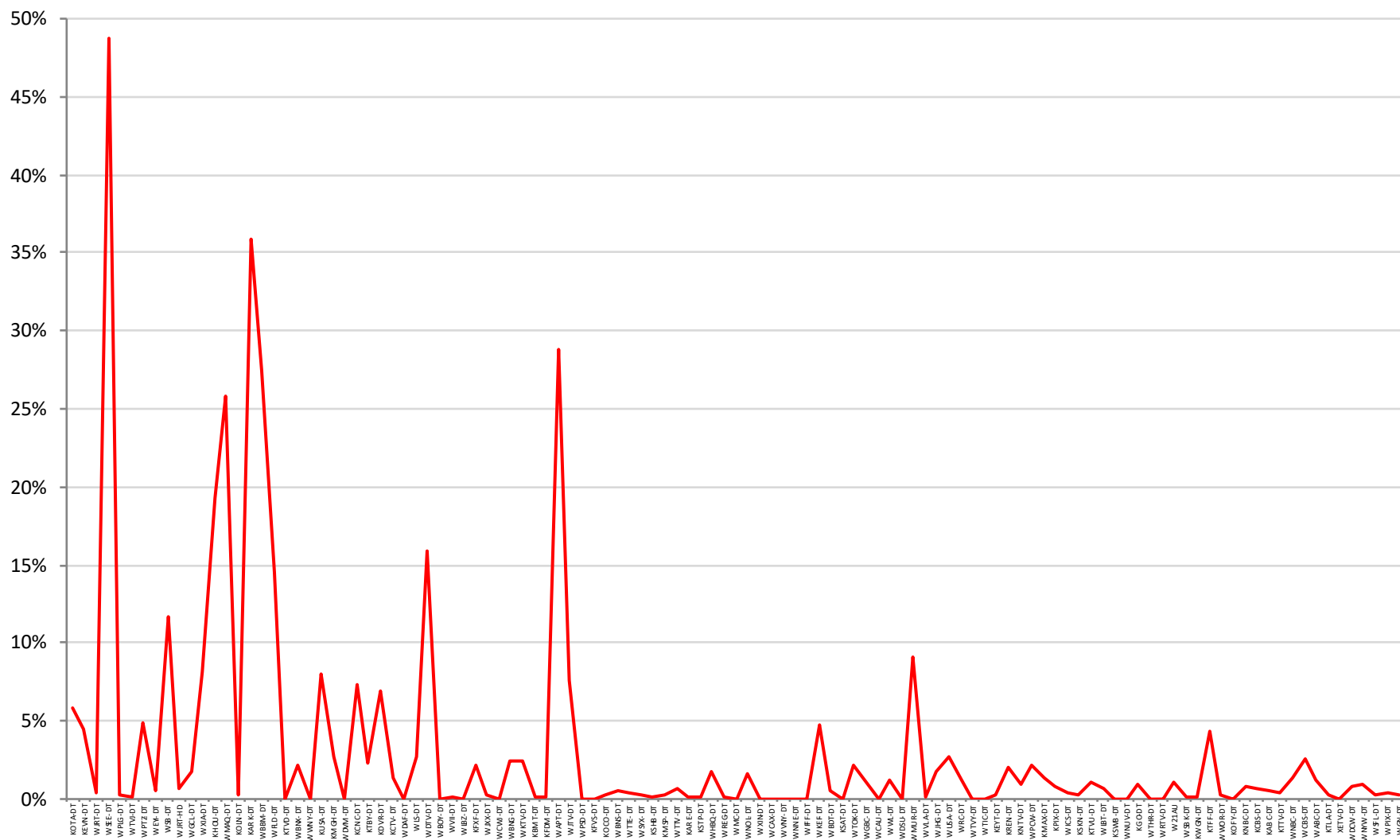
Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2011): Model 3
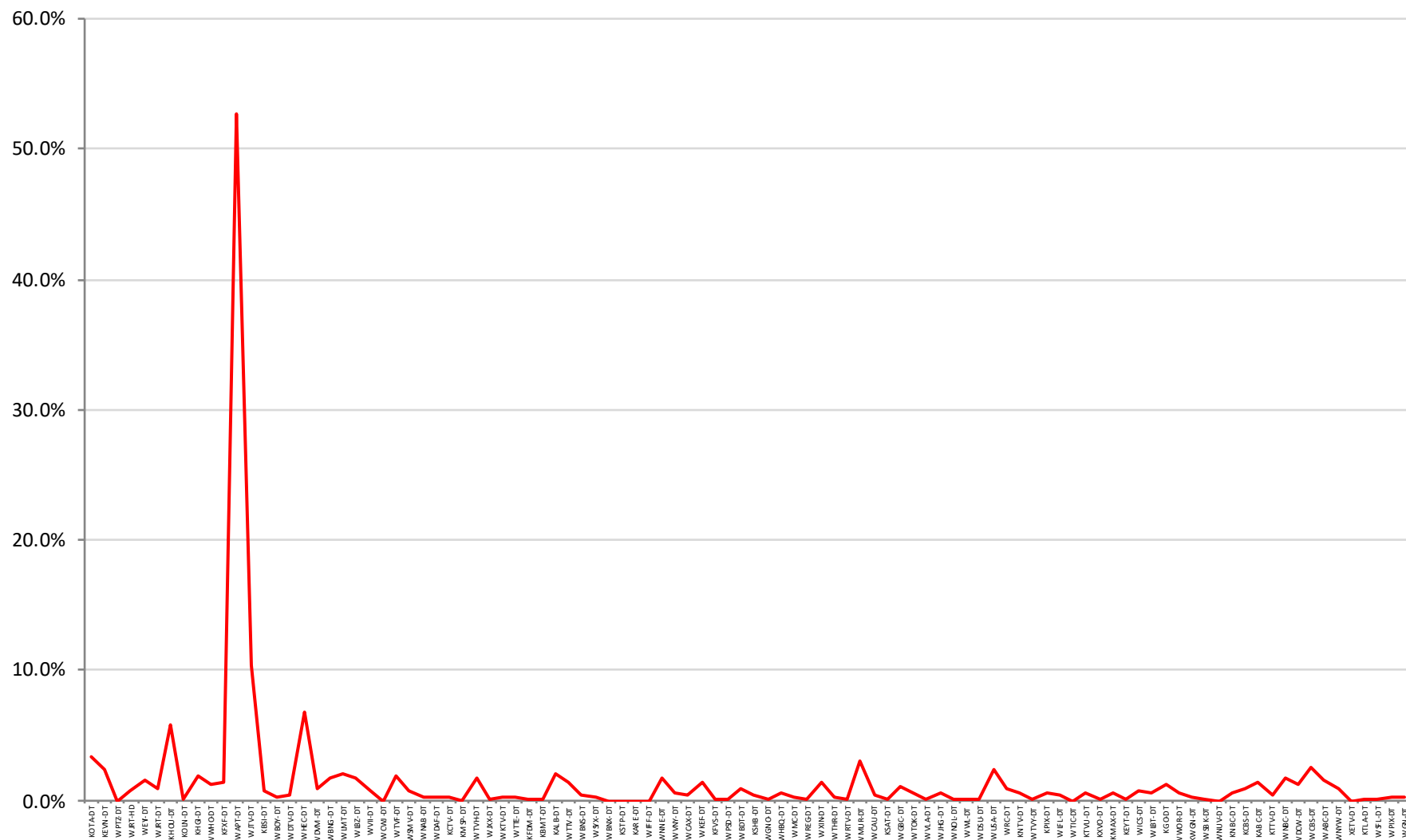
Average Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2012): Model 3

Average Gray Estimated Distant Viewing Households Divided by Distant Subscribers (2013): Model 3

Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2010): Model 3

Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2011): Model 3

Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2012): Model 3

Maximum Gray Estimated Distant Viewing Households
Divided by Distant Subscribers (2013): Model 3
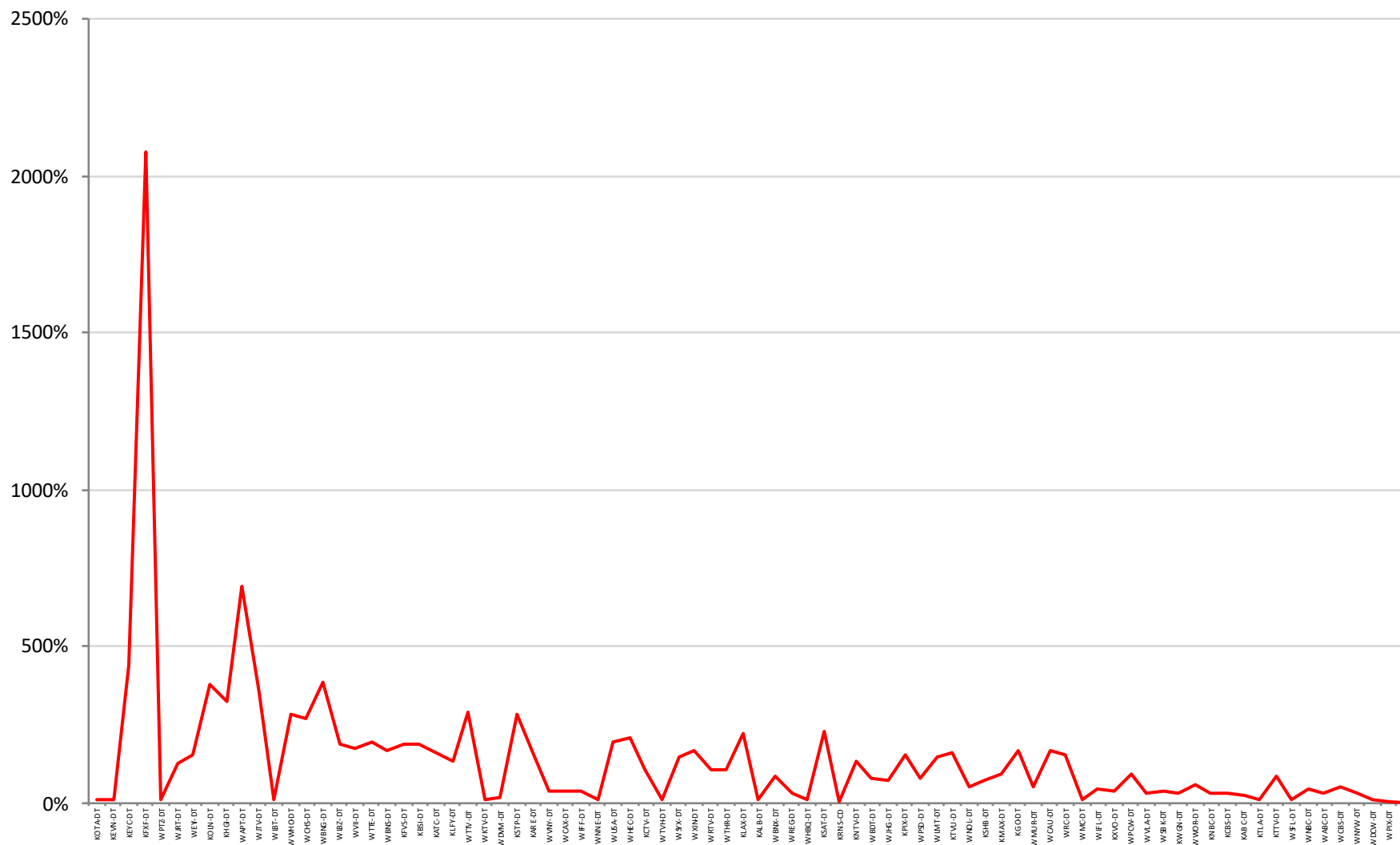
Appendix S: Lindstrom data and Gray estimates for stations in Gray 2010-13 analysis

APPENDIX S

REDACTED - RESTRICTED PURSUANT TO
PROTECTIVE ORDER, 14-CRB-0011-SD (2010-13) (MAR. 31 2016)

Before the
COPYRIGHT ROYALTY JUDGES
Washington, DC

	)	
In re	)	
	)	
DISTRIBUTION OF	)	**NO. 14-CRB-0011-SD (2010-13)**
SATELLITE ROYALTY FUNDS	)	
	)	

Written Rebuttal Testimony of

Brad Adgate

August 26, 2019

1. **Qualifications**

I have approximately forty years of experience working in media with a number of large media companies and advertising agencies. I was Senior Director, Media Insights at Comcast Spotlight (2015-17), Senior VP of Research at Horizon Media (1998-2015), Ad Sales Research Director at International Family Entertainment (1993-98), Ad Sales Research Manager at Group W Communications (1991-93), Research & Data Manager at Turner Broadcasting (1990-91), Manager Ad Sales Research & Marketing at LBS Communications (1986-1990) and Associate Media Research Director at Saatchi & Saatchi Compton (1984-86). I began my career in media research in 1978, at Gray Advertising, Inc. Currently, I am an independent media consultant based in Arlington, Massachusetts.

I have used Nielsen ratings data throughout my career. I have been actively involved as a liaison between Nielsen and the media and advertising organizations that employed me. I have written newsletters and white papers and given presentations on how Nielsen measures television ratings. I am familiar with the methodologies Nielsen uses to measure both national television and local television audiences.

I have been actively involved in a number of trade organizations and industry advisory boards. From 2010 to 2017, I was a member of Nielsen's Local Policy Guideline's Committee (LPGC), a group consisting of senior research personnel from advertising agencies, local television stations and cable systems that were Nielsen clients. The LPGC reviews and advises Nielsen on any proposed methodological changes, among other relevant topics concerning local television measurement. I was also a member of the Nielsen-funded Council for Research Excellence (CRE) from 2008 to 2017. The CRE served as an independent body of senior level research professionals with the objective of identifying important audience measurement issues.

From 2005 to 2017, I was on the Board of Directors and a member of the television committee of the Media Rating Council (MRC). The MRC is a government sanctioned non-profit organization consisting of senior research personnel from across the media research industry. The MRC accredits audience measurement methodologies, and organizes ongoing and independent audits of the methodologies used by media research companies, including Nielsen. From 2005 to 2015, I was also a member of the Media Measurement Committee for the American Association of Advertising Agencies (4A's), a trade association consisting of hundreds of participating advertising agencies. I chaired the Media Measurement Committee from 2011-15.

I have published numerous articles on the media industry in *Adweek, Advertising Age*, *MediaPost, Media Life Magazine* and *The Advertiser* (a publication from the Association of National Advertisers). I am currently a contributor to Forbes.com, where I write about media. I have a Bachelor of Science degree in history and political science from Jacksonville University.

A more detailed description of my qualifications is set forth in Appendix A.

2. **Introduction and Summary**

I have reviewed the testimony of Jeffrey S. Gray, Ph.D. and Paul Lindstrom.[1] I was asked by Joint Sports Claimants (JSC) to address Dr. Gray's use of data taken from Nielsen's National People Meter (NPM) sample in his study that attempts to measure "viewing" of signals retransmitted pursuant to Section 119 of the Copyright Act.[2]

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[1] Amended Written Direct Testimony of Jeffrey S. Gray, Ph.D., Docket No. 14-CRB-0011-SD (2010-13) (June 7, 2019) ("Gray WDT"); Written Direct Testimony of Paul Lindstrom, Docket No. 14-CRB-0011-SD (2010-13) (Mar. 22, 2019) ("Lindstrom WDT").

[2] I have reviewed the Written Rebuttal Testimony of Susan Nathan in the 2010-13 cable allocation proceeding. *See* JSC Ex. 20, Corrected Written Rebuttal Testimony of Susan Nathan, Docket No. 14-CRB-0010-CD (2010-13) (Oct. 5, 2017) ("Nathan WRT"). Ms. Nathan's testimony is an accurate description of the problems that arise when using the NPM data to attempt to measure viewing that is not national in scope.

The NPM is designed to estimate national viewership of programs that are distributed nationwide. It is not designed to measure viewership by non-national audiences of stations that are not distributed on a national basis. With the exception of WGNA, the signals distantly retransmitted by satellite carriers are not distributed nationwide. Rather, they are distributed to subscribers in certain regions of the country.

Because of the NPM's design, professionals that rely on Nielsen to make business decisions do not use the NPM to obtain estimates of local viewing. Rather, they turn to Nielsen's local viewing samples such as its Local People Meter Survey. In my 40 years in the media business, I never used the NPM to estimate limited, non-national viewing.

Using a national sample to measure limited, non-national viewing, as I understand Dr. Gray has attempted to do, has several problems. First, the NPM may not have sufficient or representative households to estimate viewing in a given region. Second, the weights Nielsen has developed for the NPM to project viewership from the households within the sample to a national audience are not appropriate for projecting viewing to much smaller, non-national audiences.

Given the poor fit between the NPM and the non-national distribution of all Section 119 signals other than WGNA, it is not surprising that the NPM data on which Dr. Gray relies sometimes estimate impossible, or highly implausible, measures of distant viewing. In some instances, the data estimate that a greater number of households are watching a given program than the total number of households who received the signal carrying the program. In other instances, the data estimate that marginal programs, including infomercials, are more widely viewed than the Super Bowl.

3. Nielsen Uses Different Surveys to Measure Local and National Viewing Audiences

A. National Audience Measurement

Mr. Lindstrom provided Dr. Gray with a "custom analysis" (a subset) taken from Nielsen's "national household metered viewing data" for each year in the 2010-13 period.[3] From 2010 to 2013, Nielsen's only available national metered viewing data came from Nielsen's National People Meter survey or "NPM." The "people meter" is an electronic device consisting of a meter, which passively captures television set tuning in sample households, and a remote control, which members of the sample household are instructed to use to indicate the household member who is viewing. The NPM is designed to measure viewership of "nationally televised programs."[4]

During the 2010-13 period, Nielsen's NPM sample included about 22,000 installed households, which were selected to represent a nationwide population of more than 114,000,000 households.[5] The NPM sample households are randomly selected and recruited by Nielsen using the most recent population data, including data taken from the U.S. Census. Households in the NPM sample are widely dispersed and selected to represent the television viewing audience of nationally distributed television channels.

Nielsen weights the NPM sample every day based on the amount of usable ("in-tab") viewing data available. Typically, during the 2010-13 period, the number of in-tab households on a given day was approximately 80-85% of the total of approximately 22,000 installed NPM

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[3] *See* Lindstrom WDT at 4.

[4] Nielsen National Reference Supplement 2012-13 at 1-1 (Bates Nos. PS-002182-2374) ("2012-13 Reference Supplement").

[5] *See, e.g.*, Nielsen, *Nielsen Estimates Number of U.S. Television Homes to be 114.7 Million* (May 3, 2011), https://www.nielsen.com/us/en/insights/article/2011/nielsen-estimates-number-of-u-s-television-homes-to-be-114-7-million/.

households.[6] Thus, the weights employed by Nielsen change on a daily basis. Nielsen uses

weights to account for a number of household characteristics that can impact viewing habits. These

include: age of head of household, presence of children, geography, household size, county size,

number of operable sets, education of householder, digital set top box, presence of a DVR, and

PC/Internet access, among others.[7] The purpose of Nielsen's use of these weights is to provide a

representative and accurate estimate of the viewing audiences of nationally distributed programs,

based on the national population. As Nielsen explains, "[t]he weight of a sample member equals

the number of members of the population that the sample member represents. For example, if a

sample member has an assigned weight of 20,000 for a particular day, it means that the viewing

for that person on that day represents the viewing of 20,000 people in the United States."[8]

A large majority (about 80%) of nationally distributed cable networks measured by the

NPM are available in over 50% of households in the country. The wider the distribution, the

greater the number of NPM households who could potentially view the program, which provides

for more stable and reliable ratings. In December 2013, there were over 100 cable networks that

were measured by Nielsen's NPM.[9] Of these, 35 networks had more than 90 million household

subscribers. Only one network, Discovery en Espanol (distributed to 7.3 million households), had

fewer than 20 million household subscribers. By contrast, the largest subscriber base for any non-

WGNA Section 119 signal was under 2 million subscribers, and many Section 119 signals had

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[6] Mr. Lindstrom agreed with this figure in the 2010-13 cable royalty distribution proceeding. *See* Oral Testimony of Paul Lindstrom, Docket No. 14-CRB-0010-CD (2010-13) (March 14, 2018) at 3639:5-3640:18.

[7] 2012-13 Reference Supplement at 3-1.

[8] *See* Nielsen, *Nielsen Audience Watch User Guide*, *Version. 7.2.5* (Aug. 2011), https://www.nielsen.com/wp-content/uploads/sites/3/2019/04/AW-UserGuide.pdf.

[9] TV By The Numbers, *List of How Many Homes Each Cable Network Is In - Cable Network Coverage Estimates As Of August 2013* (Aug. 23, 2013), https://tvbythenumbers.zap2it.com/reference/list-of-how-many-homes-each-cable-networks-is-in-cable-network-coverage-estimates-as-of-august-2013/199072/.

total distant subscriber audiences numbering in the low thousands. No cable networks measured by the NPM had comparably limited distribution.

The NPM was accredited by the MRC for measuring television ratings of national distributed programming. To the best of my knowledge, the MRC, of which I was a long-time member, never accredited the use of the NPM for local measurement and I would not expect it to have done so.

B. Local Audience Measurement

There are 210 local television markets in the United States, known as Designated Market Areas (DMAs). In the 2010-13 period, Nielsen measured viewing within particular local television markets with three different methodologies: Local People Meters (LPM); set top meters; and television diaries. Nielsen's measurement approach in each DMA is designed to match the particular population being measured and utilizes sample sizes based on the size and other characteristics of the DMA (*e.g.*, presence of children, language spoken) to provide more consistent and accurate ratings. Sample households are selected to be representative of the locality being measured rather than the national population. Additionally, Nielsen uses weights specific to each market. The weights Nielsen uses vary by market and can differ significantly from the weights used by the NPM.

For the largest 25 DMAs, Nielsen uses the LPM to measure local television audiences. Like the NPM, the LPM uses the same technology (the people meter) to measure viewing. The LPM, however, measures only the audiences of local television stations and any other programming viewed in the "home" television market. To accurately estimate viewing within a particular local market, Nielsen adds a significant number of LPM homes to the NPM sample households present in the market. In the 2010-13 period, Nielsen added between

██.[10] Additionally, the LPM sample in each local market is weighted to reflect the various population characteristics within that local market. The 25 LPM markets account for about 50% of all U.S. television households and about 60% of all local television ad spending.

Outside of the top 25 DMAs, the next 31 DMAs by size were measured by set top meters and TV diaries in the 2010-13 period. The meters passively measure television set tuning in sample households 24 hours a day, 365 days per year, but do not collect information about which member of the household is viewing. Each metered household is randomly selected by Nielsen and every household has an equal chance to be a part of the sample. The sample is designed to measure the relevant local TV market. During 2010-13, person-specific viewing data was collected only during the four "sweep" months (February, May, July and November), from TV diaries designed specifically for the population characteristics of each DMA. Audience data from the set top meters and television diaries in these markets was never included in the NPM.

For the remaining 154 smallest DMAs, Nielsen relied exclusively on television diaries for household and demographic ratings. Respondents were asked to record their viewing with a weekly television diary and instructed to list all the programming watched by all members of the household. The numbers of respondents mailed diaries varied with the size of the DMA. In addition, for those television markets that had historically low response rates, Nielsen sent a higher proportion of diaries. Nielsen applied weights to the television diary data based on the population and characteristics of each individual local market. Data from the television diaries in these markets was never included in the NPM.

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[10] 2012-13 Reference Supplement at 1-1.

4. **Industry Professionals Use Local Measurement Tools to Measure Local Audiences**

In my experience, advertising industry professionals use the NPM to measure national audiences for nationally-distributed programs, and local television measurements to measure local audience viewership. I have never known any industry professional who used a modified NPM for local audience measurement, nor would I advise anyone to do so.

Below, I provide two examples of industry professionals choosing to use Nielsen's local audience measurements to transact local advertising sales. These examples demonstrate the delineation within the advertising community between the appropriate uses of the NPM and Nielsen's local market television measures. These practices have been established for decades.

i.   Barter Syndication

Each year from 2010 to 2013, Nielsen measured the audience delivery of over 100 syndicated television shows both nationally and locally. These include such long-running and popular programs as *Entertainment Tonight*, *Ellen,* and *Jeopardy!* Programmers distribute these shows on a market-by-market basis, creating an "ad hoc" television network. In nationally distributed syndication, the advertising time is split between national ads that are sold by the distributer to national advertisers and local ads sold by television stations to local advertisers. The national ads sales are transacted using Nielsen's NPM, and the local ads sales are transacted using Nielsen's local measurement services. Additionally, when a local television station has to decide whether to renew a syndication deal, or change the time of day when the program is aired, it will look only to local viewing measures; it will not rely upon the NPM.

ii. Network Television Advertising Sales

On network television programs, such as a telecast of the MLB All-Star game on Fox, advertising time is split between local and national audiences. The majority of the advertising

time during these telecasts is devoted to the national audience, but every network program is required to set aside several minutes of each hour for "local avails"—blocks of time that the local station can sell to local advertisers. The networks use the NPM to measure ratings for national ads sales, and the local television stations use Nielsen's local measurement services to estimate viewership for local ads sales.

5. Use of the NPM to Measure Local Viewing Results in Several Measurement Issues

Using the NPM to attempt to measure viewing to Section 119 signals that are not nationally distributed leads to several issues. First, there may not be sufficient NPM households in a given geographic area to reliably measure viewing in the area. Insufficient NPM coverage manifests in the Lindstrom data relied upon by Dr. Gray as an absence of viewing data for almost 94% of the quarter hours being studied. Second, the NPM weights used to project from the sample population to the national population are inappropriate for projecting to a geographically limited audience. Using the NPM weights results in viewing estimates that are impossibly high. These issues further demonstrate that the NPM is not suited to measuring viewership to non-nationally distributed channels.

A. Sample Size and Non-Recorded Viewing

The size and makeup of the NPM sample is designed to be representative of the national population of television households. The participating households are not selected so as to be sufficient to measure viewing in a given locality. With the exception of WGNA, none of the signals retransmitted pursuant to Section 119 of the Copyright Act are available nationally. Rather, they are retransmitted only to subscribers in particular regions or localities. In these instances, there are not likely to be a sufficient number of NPM sample households in a given region to estimate viewing in that region.

I understand that the data provided by Mr. Lindstrom to Dr. Gray lack any viewing by NPM households for almost 94% percent of the records at issue.[11] Where the NPM data do show viewing, it is very rarely more than 2 households. This paucity of data suggests an insufficient sample population. In order to know whether the absence of NPM data for a given record results from insufficient sample size, it is important to understand how many NPM households could have viewed a given program in a given region. If there are no NPM households or an insufficient number of NPM households, the absence of Nielsen viewing data, or low numbers of NPM households viewing a program, does not suggest the absence of or limited viewing, but rather only indicates an insufficient sample.

Nielsen recognizes the importance of having a sufficient sample size. Based on my experience working with Nielsen and with Nielsen's standard reports, I am aware that Nielsen applies minimum audience level requirements to the ratings data in its standard reports. In particular, during the 2010-13 period, Nielsen required that a program have the ability to reach (*i.e.*, include within its coverage area) a minimum of 145 respondents in the "in-tab" NPM sample before it would report a daily rating. Similarly, during the 2010-13 period, Nielsen required that a program have the ability to reach a minimum daily average of 68 respondents in the "in-tab" NPM sample before it would report a monthly rating.

I understand counsel for JSC requested counsel for Program Suppliers provide "for each of the calendar years 2010, 2011, 2012, and 2013, the number of National People Meter households who could possibly view each call sign's signal within the given year" as well as "the distribution

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[11] Written Rebuttal Testimony of William E. Wecker, Ph.D. and R. Garrison Harvey, Docket. No. 14-CRB-0011-SD (2010-13) (Aug. 26, 2019), at ¶ 5 ("Wecker WRT").

by DMA of the households in the sample used to collect HHV data."[12] I further understand that counsel for Program suppliers responded that—aside from the information available in the Nielsen National Reference Supplements—neither Dr. Gray nor Mr. Lindstrom have any data or other information regarding the universe of NPM sample homes that could have viewed each program included in Dr. Gray's study, including without limitation the Nielsen in-tab count.[13] Without knowing how many households in the NPM sample could possibly have viewed a particular program it is impossible to know whether the NPM contained a sufficient number of sample homes to meet the minimum audience level requirement that Nielsen applies to its standard reports.

Moreover, without knowledge of the NPM sample population that could have viewed a particular program, it is impossible to interpret the meaning of any instance of recorded or non-recorded viewing. If the data provided by Mr. Lindstrom shows zero viewing in a quarter hour, there is no way to tell if it is because (a) there were no households in the NPM sample that received the station on a distant basis; (b) only a small number of NPM households received the signal on a distant basis, and none chose to watch it; or (c) a large number of NPM households received the station on a distant basis, and all of them chose not to watch it. An instance of non-recorded viewing would mean very different things about the viewership for a particular program in each scenario. Dr. Gray's "custom analysis" provides no data to distinguish between these scenarios. Conversely, using the NPM to attempt to measure distantly retransmitted signals can also result in

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[12] *See* JSC Follow Up Discovery Requests to Program Suppliers, at Lindstrom Follow Up Requests 7(e)(iv), (ix) and Gray Follow-Up Request 4(h)(vi) (April 26, 2019).
[13] *See* E-mail from L. Plovnick to M. Kientzle (May 23, 2019).   The Nielsen National Reference Supplements do not provide any information on the specific geographic locations of NPM households or identify which of the NPM households could have viewed the programming retransmitted on Section 119 signals during the 2010-13 period.

the overcounting of viewership if there are a disproportionate number of NPM households relative to the size and makeup of the signal.

The overall level of non-recorded viewing in Dr. Gray's data bears little resemblance to the data included in standard, Nielsen-branded reports, in which no instances of non-recorded viewing are reported *at all*. In its standard reports, if Nielsen does not capture a positive rating for a particular quarter hour, Nielsen will identify that program (or time period) with a symbol indicating that it does not have sufficient data to report a rating or an audience.

Throughout my career—in which I have extensively used Nielsen viewing data to advise networks, advertisers, and ad buyers—I would not have relied on a data set that lacked data for almost 94% of the periods being studied, or anything close to such a data set.

B. Nielsen NPM Weights Cannot Be Used To Measure Local Viewing

Dr. Gray explains that he relies on the weighted NPM data for his viewing study. The Nielsen NPM weights are designed, however, to correspond with the national viewing audience, and cannot be used to estimate viewing within a much smaller, non-national audience.[14] As a result, Dr. Gray relies on data that includes numerous viewing estimates that are highly implausible or in fact impossible.

Nielsen NPM weights are generally between 4,000 to 30,000 per NPM household.[15] The weights of NPM sample members equals the number of members of the population that the sample member represents. The weights would therefore be very different if one were trying to measure a national audience, or were measuring a smaller local audience.

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[14] This is not to suggest that Dr. Gray should have used unweighted NPM data. Rather, if the data was otherwise sufficient (and as I have explained it is not), one would need to develop weights representative of the particular locality being measured.

[15] JSC Ex. 20 (Nathan WRT) at 9.

Dr. Gray applies these national weights to programs that he knows are only received on a distant basis by non-national audiences. Some of these audiences are as small as 1,000 or fewer distant subscribers. All but WGNA have audiences that are under 2 million, which, as I explain above, is far smaller than the national audiences that Nielsen uses the NPM to measure.[16]

As a result, the application of Nielsen's NPM weights inflates the viewing estimates for Section 119 signals to impossible levels. This is particularly true for those Section 119 signals with fewer distant subscribers. The problems with using the NPM weights to project non-national viewing are readily apparent in Dr. Gray's study. I understand that in numerous instances, Dr. Gray estimates viewing levels for a distantly retransmitted signal that far exceed the number of subscribers for the signal. This is simply not possible.

For instance, the Super Bowl was the most watched television program of the year throughout the 2010-13 period, averaging a household rating of about 46.[17] The testimony of Dr. Wecker and Mr. Harvey indicates that more than 76,600 records in the data Dr. Gray relies upon show viewership levels that were greater than the Super Bowl.[18] Some of these records correspond to programs that are unquestionably far less popular than the Super Bowl, such as an infomercial entitled "Learn How To Eat Yourself Skinny."[19] Indeed, their testimony indicates that for approximately 46,000 records in the data, the weighted viewing estimate exceeds 100% of the distant subscribers to the station, which is not possible.[20] In advising networks, advertisers, and ad buyers, I would not rely on viewing data that purported to show that an informercial had a

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[16] *See supra* pp. 5-6.
[17] Nielsen, *Super Bowl XLVII Draws 108.7 Million Viewers, 26.1 Million Tweets* (Feb. 5, 2013), https://www.nielsen.com/us/en/insights/article/2013/super-bowl-xlvii-draws-108-7-million-viewers-26-1-tweets/
[18] Wecker WRT, at ¶ 33.
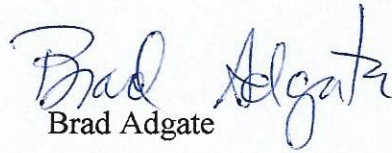[19] *Id.* at ¶ 32.
[20] *Id.* at ¶ 25.

higher rating than the Super Bowl, or that more than 100% of the possible audience tuned in to watch a program.

Conclusion

Use of data drawn from the NPM is not a reliable method to measure non-national viewership of Section 119 signals that are not distributed nationally. The NPM was never intended to be used for this sort of measurement; it is designed to be representative of the entire country and is not capable of providing reliable measurements of viewership of signals that are only distributed to narrower group of subscribers.

I declare under penalty of perjury that the foregoing is true and correct.

August 26, 2019.

Brad Adgate

APPENDIX A

BRADFORD J. (BRAD) ADGATE

Arlington, MA 02141 • Mobile (914) 260-7645 • Email: bradadgate@gmail.com

EXPERIENCE

MEDIA CONSULTANT, Arlington, MA (May 2017-present)
- Leveraging experience working with media companies to help analyze data and convert into usable insights across all channels.
- Capitalizing from my extensive media contacts for interviews on key media trends.
- A contributor to Forbes.com writing on a wide range of current media topics. https://www.forbes.com/sites/bradadgate/#235be4907c9a
- Involved in various proprietary projects including advanced data driven television buying, bot fraud on mobile devices, media consumption of millennials, creating insights for emerging broadcast networks.

SENIOR DIRECTOR, MEDIA INSIGHT, Comcast Spotlight, Quincy, MA (Dec 2015-Apr 2017)
Responsible for ad sales support, marketplace intelligence and local media measurement
- Led development of new audience measurement methodology, in major markets, to increase the value of lower rated cable networks.
- Generated significant revenue growth in political ad dollars by using "third party" voting records with Comcast's return path data, including best networks/dayparts to target "persuadable voters" and identifying "swing counties" for geo-targeting.
- Tracked industry activity and authored weekly e-newsletter to account executives at Comcast Spotlight to ensure consistent messaging and approach across 80 markets.
- Provided recommendations promoting video-on-demand as an ad revenue opportunity for Comcast's roll-out of Premium Video Content with its new cross platform strategy.
- Developed and managed data from online survey testing the impact of ad messaging for advertisers not spending on Comcast; inaugural category was QSR's. Survey highlighted the diverse perceptions of brands locally in pursuit of programmatic media agreements.
- Managed Google Analytics projects that measured web traffic pre/post ad campaigns across Comcast Spotlight's TV Everywhere platform. Goal to promote TV Everywhere as an advertising platform.

SENIOR VICE PRESIDENT, DIRECTOR OF RESEARCH, Horizon Media, Inc., New York (1998-2015)
Responsible for data support, media insights, secure new business and to raise company profile
- Was an integral member of the senior management team, ad billings grew from $150 million in 1998 to over $5 billion in 2015.
- Conceptualized and wrote a monthly newsletter "On the Horizon" on a wide variety of media, consumer, digital, advertiser and audience measurement topics, distributed to hundreds of clients and new business prospects to promote company.
- Developed a number of proprietary research tools focused on segmentation for enhanced geographic and demographic targeting.
- Gave ongoing presentations to prominent clients on the media landscape and future media trends, creating dialog on advertising marketplace and upcoming opportunities.
- Developed an outreach program with financial institutions, trade and consumer press that marketed Horizon Media as industry thought leaders.
- Evaluated research services and maintained research budget.

AD SALES RESEARCH DIRECTOR, International Family Entertainment, New York (1993-98)
Responsible for sales support, expand client roster, evaluate research needs for cable network
- Developed corporate "white papers" providing account executives with pertinent background information on non-client advertisers, resulting in ad revenue growth.
- Created and implemented the first companywide media training program, designed to educate and familiarize entry level personnel and strengthen the skills of future account executives.
- Provided an extensive evaluation of the kids, teens and parents in the consumer marketplace, in preparation for the re-launch of the Fox Family Channel that re-positioned the network in the ad marketplace.

PREVIOUS MEDIA/ADVERTISING EXPERIENCE
- **Group W Satellite Communications, New York, Manager Ad Sales Research**
- **Turner Broadcasting, Inc., New York, Research & Data Manager**
- **LBS Communications, New York, Manager Ad Sales Research & Marketing**
- **Saatchi & Saatchi, Inc., New York, Associate Research Director**
- **Backer & Spielvogel, Inc., New York, Assistant Network Buyer, Assistant Media Planner**
- **Grey Advertising, Inc., New York, Project Director, Media Analysis**

CAREER HIGHLIGHTS
Chaired 4A's Media Measurement Committee
- Was responsible for setting bi-monthly meeting agenda for senior research executives with a focus on cross platform with attribution measurement. Wrote first POV for the 4A's on the need to improve TV measurement.

Chaired Digital Committee for the Council for Research Excellence
- Headed digital committee working with GfK on an acceleration, longitudinal and ethnography study on the impact new consumer electronic products have on the dynamics of household media consumption.

INTERESTS
- Reader of non-fiction books, business magazines and media news
- Long distance running
- Visited every Major League Baseball park

EDUCATION
- **B.S., History & Political Science, Jacksonville University, Jacksonville, FL**

Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

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In re)	
)	
DISTRIBUTION OF)	**NO. 14-CRB-0011-SD (2010-13)**
SATELLITE ROYALTY FUNDS)	
)	

Written Rebuttal Testimony

Nancy A. Mathiowetz, Ph.D.

August 26, 2019

I.   Qualifications

1.   I am Professor Emerita, Department of Sociology at the University of Wisconsin-Milwaukee (UWM). Prior to joining the faculty at UWM in 2003, I was Associate Professor, Joint Program in Survey Methodology, University of Maryland and University of Michigan. I received a B.S. from the University of Wisconsin and a M.S. (Biostatistics) and Ph.D. (Sociology) from the University of Michigan. I served as co-Editor, *Public Opinion Quarterly* from 2008-2012 and as President, American Association for Public Opinion Research (AAPOR) from 2007-2008. In 2015, I was awarded the AAPOR Award for Exceptional Distinguished Achievement. Between 1998 and 2004, I was an associate editor of the *Journal of Official Statistics* and I have served as a reviewer for numerous other journals and publications. I am an elected Fellow, American Statistical Association. I have testified as an expert on survey research methodology in federal and state court cases, including the 2010-2013 Distribution of Cable Royalty Funds proceeding.

2.   My research focuses on various aspects of survey methodology, including, but not limited to, the effects of mode and methods of data collection, question and questionnaire design, response error, and means to assess and reduce various sources of error in the survey process. I have taught courses on survey methodology, questionnaire design, and advanced statistical methods and have offered short courses on questionnaire design to various audiences. My curriculum vitae, which outlines my professional experience as well as my publications, is included as Appendix A.

II.   Introduction and Summary

3.   A number of experts testifying on behalf of Settling Devotional Claimants ("SDC") advocate for using the cable operator surveys presented in the 2010-13 cable proceeding to determine the allocation of the 2010-13 satellite royalties (Erdem 2010-13 Satellite WDT ¶ 46; Sanders 2010-13 Satellite WDT ¶ 8; Brown 2010-13 Satellite WDT at 26).

4.   As I explain below, if the Copyright Royalty Judges (Judges) rely on survey evidence to allocate satellite royalties in this proceeding, they should rely on the 2010-13 Bortz surveys and not the 2010-13 Horowitz surveys. The Bortz surveys provide a valid and reliable assessment of the relative market value of the different categories of distant signal programming that cable systems carried during the years 2010-13, and the Judges have long relied on the Bortz surveys in making copyright allocation determinations. Although the Judges' 2010-13 Cable Final Determination accorded less weight to Bortz than to Horowitz, the Judges' primary concern with the Bortz surveys (potential undervaluation of PTV and CCG programming) is not an issue in this proceeding because PTV and CCG programming is not carried under Section 119.

5.   In contrast, the Horowitz surveys contain fundamental flaws that remain relevant in this proceeding. Horowitz provided incorrect and misleading program examples in identifying Program Suppliers' programming, failed to identify compensable programming for systems that carried WGNA as their only distant signal, and used a data

collection approach that resulted in a significant burden on the respondents and a high concentration of responses attributable to a small number of individual respondents.[1]

III. Bortz Surveys

6.   The 2010-13 Bortz surveys continued a long series of similar surveys that employed the constant sum methodology for estimating the relative value of programming on distant signals, and as the Judges observed in their 2010-13 Cable Final Determination, prior allocation determinations have "relied heavily and almost exclusively" on the Bortz surveys (2010-13 Cable Final Determination at 3591). As I testified in the 2010-13 cable proceeding, it is my professional opinion that the resulting data offer both a valid and reliable assessment of the relative program values for distant signal programming among cable system operators during the years 2010-13 (Mathiowetz 2010-13 Cable WDT (JSC Exhibit 15) ¶ 48).

7.   Numerous witnesses testified about the Bortz and Horowitz surveys in the 2010-13 cable proceeding, and the Judges' 2010-13 Cable Final Determination included detailed analysis of that testimony (2010-13 Cable Final Determination at 3582-91). Although the Judges and their predecessors have long relied on the Bortz surveys in allocating cable royalties, the Judges decided to accord less weight to the Bortz surveys than to the Horowitz surveys (2010-13 Cable Final Determination at 3591).

8.   In explaining why they accorded greater weight to the Horowitz surveys, the Judges focused on two criticisms of Bortz. The Judges' principal concern with Bortz was

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[1] I note that the Judges properly found that Horowitz's addition of an "Other Sports" category was a serious flaw. As the Judges explained in their 2010-13 Cable Final Determination, Horowitz's "Other Sports" category "created a value where none, or next to none, existed" (2010-13 Cable Final Determination at 3591). The Judges therefore reallocated the "Other Sports" allocation to the remaining program categories in Horowitz.

that it potentially undervalued PTV and CCG programming. The Judges also noted that they believed one of Bortz's introductory questions could have caused respondents confusion in answering the survey's relative value question.

9.   The Judges explained that "particularly [because of] the acknowledged systematic bias against PTV and CCG programming, the Judges accord relatively less weight to the 'Augmented' Bortz Survey (2010-13 Cable Final Determination at 3591). While I disagree with the Judges' assessment of how Bortz addressed PTV and CCG programming relative to Horowitz,[2] PTV and CCG programming is not carried under Section 119, and therefore the Judges' concern about the Bortz surveys' valuation of that programming is not relevant here. Indeed, in recommending that the Judges rely on survey evidence to allocate the satellite royalties, SDC witness Dr. Erdem acknowledges that the Judges' concern about bias against PTV and CCG is "eliminated" given that those program categories are not at issue in this proceeding (Erdem Satellite WDT ¶ 46).

10.   The Judges also expressed concern about one of the introductory questions for the 2010-13 Bortz surveys, where respondents were asked about ranking program categories

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[2] I agree with Bortz that it is inadvisable to survey PTV-only and CTV-only cable systems. The Bortz and Horowitz surveys use a constant sum methodology that requires respondents to allocate relative value to the categories of programming they carried on distant signals, and asking respondents to "allocate" relative value to a single program category is likely to cause confusion. Moreover, it is not necessary. The "McLaughlin augmentation" mathematically adjusts the survey results to reach the same results as if Bortz had interviewed those systems (Trautman 2010-13 Cable WRT (JSC Exhibit 21) at 35). Additionally, while Horowitz did interview systems that carried only PTV or CCG programming, most of the Horowitz systems that carried only PTV programming allocated less than 100% to PTV. The final survey results that Horowitz presented included a mathematical adjustment that treated each of those responses as if the respondent had allocated 100% to PTV (Trautman 2010-13 Cable WRT (JSC Exhibit 21) at 30). In other words, the results would have been essentially the same if Horowitz had excluded the PTV-only and CCG-only systems as Bortz did and then applied the McLaughlin augmentation.

with respect to relative costs. Specifically, the Judges stated that "[t]he Bortz Survey muddled the concepts of cost and value by means of its warm-up question that asked survey respondents to rank program categories by how expensive it would have been for the CSO to acquire them. This may have injected some confusion into the respondent's estimation of relative value." (2010-13 Cable Final Determination at 3590).

11.   I disagree with the Judges' opinion on this point. Although context effects have been well documented within the field of survey methodology, respondents are often asked to consider related constructs in adjacent questions. To assist in the differentiation across questions, methodologists often employ tools such as variation in the respondent task. We see this differentiation in the Bortz questionnaire. The warm-up question requests that the respondent *rank* the program categories (from 1 to k, where k is the highest number of program categories relevant for the respective system). While the Judges may see the concepts of "cost" and "value" in adjacent questions as potentially confusing, the actual ranking task faced by the respondent in the "cost" question is quite different from the constant sum allocation task in the "value" question and, as such, assists in differentiating the two questions. Additionally, the importance of the introductory question is not in the construct being considered, but rather in the respondent's exposure to the programming categories.

12.   Furthermore, we can examine the data post hoc for evidence of confusion on the part of the respondents with respect to the Bortz valuation question. Evidence of confusion on the part of the respondent would include high rates of missing data, illogical responses, or non-differentiation across the program categories. We see none of these patterns in the Bortz data.

13.   I also note that the results of the 2010-13 and 2004-05 Bortz surveys are very similar, despite the fact that the 2004-05 surveys did not include the introductory question about expense (Trautman 2010-13 Satellite WRT at 24).

IV.   Horowitz Surveys

14.   As I explained in my prior testimony, the Horowitz surveys are fraught with problems that render them invalid and unreliable for estimating relative value (Mathiowetz 2010-13 Cable WRT (JSC Exhibit 16) ¶¶ 43-51).

15.   The Judges found multiple problems with the Horowitz surveys, including Horowitz's use of examples for Program Suppliers programming, the failure to identify compensable programming for systems that carried WGNA as their only distant signal, and the improper addition of an "Other Sports" category[3] (2010-13 Cable Final Determination at 3590-91).

16.   In contrast to Bortz,[4] Horowitz provided survey respondents with supposed examples of programming for some of the program categories they were asked to value. The examples that Horowitz provided for the Program Suppliers categories contained numerous errors, both with respect to all of the WGNA-only systems and systems that included only WGNA and public broadcasting, as well as many of the other systems (Trautman 2010-13 Cable WRT (JSC Exhibit 21) at 18-28).

17.   Although the Judges acknowledged that "Horowitz may have introduced bias by providing program examples for some of the program categories," I believe they were

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[3] As noted above, the Judges properly found that Horowitz's "Other Sports" category "created" value where none existed, and they reallocated the "Other Sports" allocations to the remaining program categories in Horowitz (2010-13 Cable Final Determination at 3591).

[4] As explained below, Bortz provided systems that carried WGNA as their only distant signal with a description of the compensable programs that actually aired on WGNA.

incorrect to conclude that Horowitz's use of examples was "not likely to skew significantly results in any of the established categories." Horowitz's use of incorrect and misleading program examples was an egregious error. The problem with those examples was particularly pronounced for the nearly 30% of Horowitz respondents that carried WGNA as their only distant signal. Horowitz provided those respondents with examples and descriptions of Program Suppliers' programming that was not actually carried on WGNA on a compensable basis, or that was not actually in the Program Suppliers' program categories (Trautman 2010-13 Cable WRT (JSC Exhibit 21) at 18-27).

18.   These errors are especially troubling in light of the fact that the WGNA-only respondents in Horowitz allocated 1.8 times as much to the Program Suppliers' "Syndicated Series" category as did the WGNA-only respondents in Bortz (Trautman 2010-13 Cable WRT (JSC Exhibit 21) at 12, Table 2). Notably, whereas Horowitz provided WGNA-only respondents with misleading and incorrect program examples, Bortz provided WGNA-only respondents with a written description of the compensable programs that they actually carried each year, including the total number of hours of such programming (Bortz Report (JSC Exhibit 7) at 30).

19.   In short, Horowitz's provision of incorrect and misleading examples violated basic principles of questionnaire design. If examples are meant to serve as a means to improve comprehension of a question or a response category, then it is imperative that the examples not be misleading. Even an accurate example may inject bias into a survey question, and as discussed in Diamond's "Reference Guide on Survey Research,"[5] a

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[5] "The Reference Guide on Survey Research" is one of the chapters in the *Reference Manual on Scientific Evidence* published by the Federal Judicial Center and the National Academy of Science.

fundamental requirement for a sound survey is that the questions must be "clear, precise and unbiased" (Diamond at 387).

20.   The Horowitz surveys also failed to identify compensable programs for systems that carried WGNA as their only distant signal. A key issue for signals that carry WGNA is for the respondent to understand which programs on WGNA are compensable and which are not. As noted above, the Bortz surveys of WGNA-only systems addressed this issue by pre-mailing affected respondents a description of the compensable programs on WGNA every year, including the total number of hours of such programming.

21.   Of particular importance is the fact that all of the non-compensable programming on WGNA falls within the Program Suppliers and Devotional categories. (Trautman 2010-13 Cable WRT (JSC Exhibit 21) at 13). To the extent that the respondent did not fully understand and differentiate between compensable and non-compensable programs, the relative valuations for the Program Suppliers categories (movies, syndicated series, and "other sports") as well as the Devotional category would have been upwardly biased.

22.   In contrast to Bortz, Horowitz merely instructed respondents that carried WGNA to "not assign any value to programs that are substituted for WGN's blacked out programming." (Horowitz 2010-13 Cable WDT at 36, Appendix A). I therefore disagree with the Judges conclusion that "Horowitz also addressed the [compensable programming] issue . . . but with less specificity than Bortz achieved in the 2010-13 survey for WGNA-only systems." Horowitz's instruction regarding blacked out programming would have been essentially useless to cable executive respondents, as cable system operators have no reason to know which programs on WGNA are substituted for blacked-out programming of the local WGN-Chicago station (Trautman

2010-13 Cable WRT (JSC Exhibit 21) at 14-14; Singer 2010-13 Cable WRT (JSC Exhibit 6) at 8).

23.   Another flaw in the Horowitz surveys that warranted more weight in the Judges' assessment was Horowitz's different data collection approach that resulted in a significant burden on the respondents and a high concentration of responses attributable to a small number of individual respondents.

24.   The Bortz and Horowitz data collection methodologies differed in their approach to identifying the respondent of interest and how interviews were conducted. The Bortz survey's approach of starting at the CSO level limited the number of cable systems for which a single executive served as a respondent to a maximum of eleven, with the average number of cable systems for which a respondent reported ranging between 2 (2011) and 2.4 (2010) and the modal number of responses being 1 (that is, most respondents only responded for one system) (Mathiowetz Cable WRT (JSC Exhibit 16) at ¶ 43; Trautman 2010-13 Cable WRT (JSC Exhibit 21), Table A-4). Moreover, when the same individual was selected to report on multiple cable systems, he or she was administered a separate questionnaire for each system so as to focus solely on a single cable system at a time.

25.   In contrast to the approach used by Bortz, the methodology used by Horowitz resulted in executives reporting on an extremely large number of cable systems, often within the same interview. For example, a single executive responding to Horowitz was asked to evaluate 60 CSOs. As a result of this data collection approach, the Horowitz data are populated by a relatively small number of respondents. Indeed, in each year, just *two* respondents account for more than a quarter of Horowitz's data. (Mathiowetz Cable

WRT (JSC Exhibit 16) at ¶ 49; Trautman Cable WRT (JSC Exhibit 21) at Table A-4).

This concentration of data is detrimental because those respondents can have an undue influence on the results.

26.   The Horowitz response data also reveal a troubling pattern among individual respondents asked to complete a large numbers of surveys. When I examined groups of surveys that were completed by a single executive in the same year, I observed a pattern of identical valuations given for CSOs that had varying lineups of distant signals. For instance, in 2013, one respondent provided information on 38 different cable systems in Horowitz's sample. For 15 of these 38 cable systems, the program valuations were as follows:

- News: 0% valuation
- Syndicated Series: 30%
- Movies: 15%
- Live Sports: 5%
- Other Sports: 0%
- Devotional: 0%
- Public Television (PTV): 50%
- Canadian: No valuation

However, the distant signals carried by these 15 cable systems varied, with no two cable systems offering the same mix of distant signals. It is quite surprising that this executive produced the exact same valuations for each of these 15 cable systems carrying different line-ups—assuming that he or she was actually interviewed separately about each system. Nor was this an isolated example; I observed the same pattern of identical valuations by executives required to report for multiple cable systems across all four years of data. These repeated identical responses for systems with non-identical signal lineups raise questions as to whether the survey protocol for separate questionnaires was in fact

correctly implemented—or whether some respondents employed "short-cuts" in response to the burden of being asked to respond for numerous systems.

27.   Also in contrast to the Bortz methodology, in the Horowitz surveys, when a single executive was responsible for multiple systems and each of those systems had *the same* distant channel lineup, then only a single survey was administered (Horowitz 2010-13 Cable WDT at 8). Pooling multiple CSOs with the same distant signal lineup into a single questionnaire incorrectly assumes that the valuation for those distant signals will be identical, regardless of the population being served by those distant signals. Indeed, Mr. Horowitz himself acknowledged the possibility that respondents who were responsible for multiple systems "would have responded differently had they been asked about each of those systems individually" (2010-13 Cable Tr. 4215 (Horowitz)).

28.   Even more troublingly, Mr. Horowitz indicated that the respondents may not have even been informed that the allocations they provided were meant to account for multiple cable systems. When questioned about how the respondents were asked to allocate value on behalf of multiple cable systems in a single survey, Mr. Horowitz himself testified that the interviewer would only identify "one system," and that he was "not certain" whether in those cases the respondents were informed that their valuations for that system would be imputed to multiple other systems (2010-13 Cable Tr. 4213-16 (Horowitz)).

V.   Conclusions

29.   The Bortz surveys provide a valid and reliable estimate of the relative value of distant signal programming, and have long been relied upon by the Judges and their predecessors. While the Judges' 2010-13 Cable Final Determination identified the potential undervaluation of PTV and CCG programming as their primary concern with

the Bortz surveys, that programming is not carried under Section 119 and therefore is not a reason to credit Horowitz over Bortz in this proceeding. Furthermore, the Horowitz surveys have fundamental flaws that remain a problem in this proceeding. Therefore, if the Judges choose to rely on survey evidence in allocating satellite royalties, they should rely on the Bortz surveys and not the Horowitz surveys.

I declare under the penalty of perjury that the foregoing is true and correct.

Executed on August 22, 2019.

Nancy A. Mathiowetz, Ph.D.

<u>APPENDIX A</u>

Nancy A. Mathiowetz

RESEARCH AND TEACHING INTERESTS

Survey methodology, research design and methods, quantitative methods, and statistics.

EDUCATION

University of Wisconsin, Madison, Wisconsin
      B.S., Sociology (with honors), 1978
University of Michigan, Ann Arbor, Michigan
      M.S., Biostatistics, 1983
      Ph.D., Sociology, 1988
      Dissertation: *The Applicability of Cognitive Theory to Long-Term Recall Questions in Social Surveys*

PROFESSIONAL EXPERIENCE

2015-	Professor Emerita, University of Wisconsin-Milwaukee
2005-2015	Professor, Sociology Department, University of Wisconsin-Milwaukee
2006-2009	Chair, Sociology Department, University of Wisconsin-Milwaukee
2003-2005	Associate Professor, Sociology Department, University of Wisconsin-Milwaukee
2001-2003	Associate Professor, Joint Program in Survey Methodology, University of Maryland; Adjunct Associate Research Scientist (Institute for Social Research) and Adjunct Associate Professor (Sociology Department), The University of Michigan
1995-2001	Assistant Professor, Joint Program in Survey Methodology, University of Maryland; Adjunct Assistant Research Scientist (Institute for Social Research) and Adjunct Assistant Professor (Sociology Department), The University of Michigan
1997-1998	ASA/NSF Fellowship, Bureau of Labor Statistics
1992	Guest Professor, Zentrum fur Umfragen, Methoden und Analysen, Germany

1992-1995	Deputy Director, Division of Statistics and Research Methodology, Agency for Health Care Policy and Research
1993-1995	Adjunct Assistant Professor, Joint Program in Survey Methodology, University of Maryland
1990-1992	Special Assistant to the Associate Director, Statistical Design, Methodology, and Standards, U.S. Bureau of the Census
1987-1990	Senior Research Analyst, National Center for Health Services Research
1984-1987	Senior Research Associate, Westat, Inc.

BOOKS AND MONOGRAPHS

Nancy Mathiowetz and Gooloo Wunderlich (2000). *Survey Measurement of Work Disability: Summary of a Workshop.* Washington, D.C.: National Academy Press.

Paul Biemer, Robert Groves, Lars Lyberg, Nancy Mathiowetz, and Seymour Sudman (eds.) (1991). *Measurement Errors in Surveys*, John Wiley and Sons.

Carla E. Maffeo and Nancy A. Mathiowetz (1988). *Evaluation of the Administrative Records in the National Medical Utilization and Expenditure Survey*. Vital and Health Statistics, Series A, No. 6, Washington, D.C.: U.S. Government Printing Office.

Nancy A. Mathiowetz and E. Pat Ward (1987). *Linking the National Medical Expenditure Survey with the National Health Interview Survey: Analysis of Field Trials*. Vital and Health Statistics, Series 2, No. 102, Washington, D.C.: U.S. Government Printing Office.

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Greg J. Duncan and Nancy A. Mathiowetz (1985). *A Validation Study of Economic Survey Data*. Ann Arbor, Michigan: The Institute for Social Research.

JOURNAL ARTICLES AND PEER REVIEWED BOOK CHAPTERS

J. Michael Brick, W.R. Andrews, and Nancy Mathiowetz (2016) "Single-Phase Mail Survey Design for Rare Population Subgroups." *Field Methods*.

James Fonk, Donna Davidoff, Thomas Lutzow, Noelle Chesley, and Nancy Mathiowetz. (2012). The Effect of Advance Directives on End-of-Life Cost Experience. *Journal of Health Care for the Poor and Underserved*, 23(3). 1137-56; DOI: 10.1353/hpu.2012.0098.

Nancy A. Mathiowetz (2008) "The Quagmire of Reporting Presidential Primary Election Polls." Presidential Address. *Public Opinion Quarterly* 72(3): 567-573.

Sunghee Lee, Nancy A. Mathiowetz, and Roger Tourangeau (2007) "Measuring Disability in Surveys: Consistency over Time and Across Respondents." *Journal of Official Statistics*, Vol. 23(2):163-184.

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John F. Moeller, Steven Cohen, Nancy Mathiowetz, and Lap-Ming Wun (2003) "Regression-Based Sampling for Persons with High Health Expenditures: Evaluating Accuracy and Yield with the 1997 MEPS." *Medical Care*, Vol 41(7): 44-52.

Nancy A. Mathiowetz (2001) "Methodological Issues in the Measurement of Persons with Disabilities." *Research in Social Science and Disability,* Vol. 2: 125-144.

John Bound, Charlie Brown, and Nancy Mathiowetz (2001) "Measurement Error in Survey Data" in J. Heckman and E. Leamer (eds.) *Handbook of Econometrics*, *Volume 5*. Amsterdam: North Holland.

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Robert A. Groves and Nancy A. Mathiowetz (2001) "Comment on Platek and Sarndal, 'Can the Statistician Deliver?'" *Journal of Official Statistics,* Vol 17(1): 51-54.

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Mick P. Couper, Nancy A. Mathiowetz, and Eleanor Singer (1995) "Related Households, Mail Handling, and Returns to the 1990 Census" *International Journal of Public Opinion Research*, Vol. 7(2): 172-177.

Nancy A. Mathiowetz and Tamra J. Lair (1994) "Getting Better? Changes or Errors in the Measurement of Functional Limitations" *Journal of Economic and Social Measurement*, Vol. 20:237-262.

John F. Moeller and Nancy A. Mathiowetz (1994) "Problems of Screening for Poverty Status" *Journal of Official Statistics*, Vol. 10 (3):327-337.

Eleanor Singer, Nancy A. Mathiowetz, and Mick P. Couper (1993) "The Impact of Privacy and Confidentiality Concerns on Survey Participation: The Case of the 1990 Census" *Public Opinion Quarterly*, 57(4):465-482.

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J. Michael Brick, W.R. Andrews, Pat Dean Brick, Howard King, Nancy A. Mathiowetz, and Lynne Stokes (2012) "Methods for Improving Response Rates in Two-Phase Mail Surveys" *Survey Practice*, Vol. 5 (3). www.surveypractice.org.

Nancy A. Mathiowetz (2003) "Behavior Coding" in M. Lewis-Beck, A. Bryman, and T. F. Liao (eds.) *Encyclopedia of Social Science Research Methods*. Thousand Oaks, CA: Sage Publications.

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Norbert Schwarz, Nancy Mathiowetz, and Robert Belli (1996) "Assessing Satisfaction with Health and Health Care: Cognitive and Communicative Processes" in R. Warnecke (ed.) *Health Survey Research Methods*. Washington, D.C.: DHHS Publication No. (PHS) 96-1013.

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Tom Smith, D. Garth Taylor, and Nancy Mathiowetz (1980) "Public Opinion and Public Regard for the Federal Government" in C. Weiss and A. Barton (eds.) *Making Bureaucracies Work*. Beverly Hills: Sage Publications.

PRESENTATIONS AND PROCEEDINGS PUBLICATIONS

Nancy A. Mathiowetz, J. Michael Brick, Sarah Cho, Jon Cohen, Scott Keeter and Kyley McGeeney (2015) "Revisiting Sample Frame and Mode Effects: A Comparison of Point Estimates." Paper presented at the 70th Annual Conference, American Association for Public Opinion Research.

J. Michael Brick, Sarah Cho, Jon Cohen, Scott Keeter, Kyley McGeeney, and Nancy A. Mathiowetz (2015) "Weighting and Sample Matching Effects of an Online Sample." Paper presented at the 70th Annual Conference, American Association for Public Opinion Research.

Scott Keeter, Nancy A. Mathiowetz, Kyley McGeeney, and Ruth Igielnik (2015). "The Challenge of Mode of Interview Effects in Public Opinion Polls." Paper presented at the 70th Annual Conference, American Association for Public Opinion Research.

Nancy A. Mathiowetz, Kirsten Olson, and Courtney Kennedy (2011) "Redesign Options for the Consumer Expenditure Survey." Paper presented to the National Academy of Sciences Workshop on the Redesign of the Consumer Expenditure Survey, October, 2011.

Nancy A. Mathiowetz, J. Michael Brick, Lynne Stokes, Rob Andrews, and Seth Muzzy (2010) "Improving Coverage and Reducing Nonresponse: A Pilot Test of a Dual Frame Mail Survey as an Alternative to an RDD Survey." Paper presented at the Joint Statistical Meeting, American Statistical Association, Vancouver, Canada.

Nancy A. Mathiowetz (2002) "Behavior Coding: Tool for the Evaluation of the Survey Process and Survey Questions: Session in Honor of the Contributions of Charles Cannell." Paper presented at the Annual Conference, American Association for Public Opinion Research.

Nancy A. Mathiowetz, Roger Tourangeau, and Paul Guerino (2002) "Measuring Persons with Disabilities." Paper presented at the Annual Conference, American Association for Public Opinion Research.

Nancy A. Mathiowetz, Roger Tourangeau, and Paul Guerino (2002) "Methodological Issues in the Measurement of Persons with Disabilities." Invited paper presented at the Joint Statistical Meetings, American Statistical Association, New York, New York.

John Moeller, Steve Cohen, Nancy Mathiowetz, and Lap-Ming Wun (2002) "Model-Based Sampling for Households with High Health Expenditures: Evaluating Accuracy and Yield with the 1997 MEPS." Paper presented at the Joint Statistical Meetings, American Statistical Association, New York, New York.

John Moeller, Steve Cohen, Nancy Mathiowetz, and Lap-Ming Wun (2001) "Model-Based Sampling for Low Income Households: An Evaluation from the 1997 Medical Expenditure Panel Survey." Paper presented at the Joint Statistical Meetings, American Statistical Association, Atlanta, Georgia.

Nancy A. Mathiowetz (2000) "Methodological Issues in the Measurement of Persons with Disabilities" Invited Paper, Joint Statistical Meetings, American Statistical Association, Indianapolis, IN.

Nancy A. Mathiowetz, Mick Couper, and Dicy Butler (2000) "Characteristics of Nonrespondents and the Impact of Nonresponse: The American Travel Survey." Fifth International Conference on Social Science Methodology, Cologne, Germany.

Nancy A. Mathiowetz (2000) "The Effects of Length of Recall on the Quality of Survey Data" Invited paper, Fourth Conference on Methodological Issues in Official Statistics, Stockholm, Sweden.

Nancy A. Mathiowetz and Annette Gartin (2000) "The Effects of Alternative Questions on Estimates of Persons with Disabilities: An Examination of the Year 2000 Decennial Census." Paper presented at the Annual Conference, American Association for Public Opinion Research, Portland, OR.

Nancy A. Mathiowetz (1999) Invited Discussant "Question Salience, Question Difficulty and Item Nonresponse in Survey Research" International Conference on Survey Nonresponse, Portland, OR.

Nancy A. Mathiowetz (1999) "The Validity of Self Reported Health Measures Among Older Adults." Paper presented at the Annual Conference, American Association for Public Opinion Research.

J. Michael Dennis, Nancy A. Mathiowetz, and others (1999) "Analysis of RDD Interviews by the Number of Call Attempts: The National Immunization Survey" Paper presented at the Annual Conference, American Association for Public Opinion Research.

Brian Harris-Kojetin and Nancy A. Mathiowetz (1998) "The Effects of Proxy Response on the Reporting of Race and Ethnicity" Paper presented at the Annual Conference, American Association for Public Opinion Research.

Nancy A. Mathiowetz (1997) "Optimal Times to Contact and Interview Respondents: Findings from a Face to Face Data Collection Effort." Paper presented at the Annual Conference, American Association for Public Opinion Research.

Nancy A. Mathiowetz and Sarah Dipko (1997) "Examining Patterns of Response Error: A Comparison of Reports by Teenagers and Adults." Paper presented at the Annual Conference, American Association for Public Opinion Research.

Nancy A. Mathiowetz (1997) "Measuring Non-Market Labor Using a Time-Use Methodology" Invited paper, International Conference on Time Use, Non-Market Work, and Family Well Being, U.S. Bureau of Labor Statistics.

Nancy A. Mathiowetz and James Lepkowski (1996) "The Effect of Different Time Frames on Single Interview Bounding Techniques." Paper presented at the Annual Conference, American Association for Public Opinion Research.

Nancy A. Mathiowetz and Linda Stinson (1996) "The Effect of Length of Recall on the Quality of Survey Data: A Meta-Analytic Approach." Paper presented at the Annual Conference, American Association for Public Opinion Research.

Nancy A. Mathiowetz (1993) "An Evaluation of Alternative Missing Data Replacement Techniques." *Proceedings of the Section on Survey Research Methods*, American Statistical Association.

Eleanor Singer, Nancy Mathiowetz, and Mick Couper (1993) "The Impact of Privacy and Confidentiality Concerns on Survey Participation: The Case of the 1990 Census." Paper presented at the Annual Conference, American Association for Public Opinion Research.

Nancy A. Mathiowetz and Tamra J. Lair (1992) "Getting Better? Changes or Errors in Estimates of Functional Status." *Proceedings of the Section on Survey Research Methods*, American Statistical Association.

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John F. Moeller and Nancy A. Mathiowetz (1991) "Catastrophic Prescription Expenditures for the Medicare Population." Paper presented at the Annual Meetings of the Gerontological Society of America.

Nancy A. Mathiowetz, Terry DeMaio, and Elizabeth Martin (1991) "Political Alienation, Voter Registration and the 1990 Census." Paper presented at the annual conference of the American Association of Public Opinion Research.

John F. Moeller and Nancy A. Mathiowetz (1990) "Problems of Screening for Poverty Status," *Proceedings of the Section on Survey Research Methods*, American Statistical Association.

Joel Leon, Tamra Lair, Pamela Farley Short, and Nancy A. Mathiowetz (1989) "1987 National Estimates of the Functionally Disabled Elderly: Policy Implications of Varying Definitions of Disability," Winter Meetings of the American Statistical Association.

Nancy A. Mathiowetz (1988) "Forgetting Events in Autobiographical Memory: Findings from a Health Care Survey," *Proceedings of the Section on Survey Research Methods*, American Statistical Association.

Nancy A. Mathiowetz (1987) "Response Error: Correlation between Estimation and Episodic Recall Tasks," *Proceedings of the Section on Survey Research Methods*, American Statistical Association.

Nancy A. Mathiowetz, Marc L. Berk, and Andrew A. White (1987) "The Effect of Changing Interviewers and Mode of Interview in a Panel Health Survey." Winter Meetings of the American Statistical Association.

Nancy A. Mathiowetz (1986) "Mode of Initial Contact for Personal Interviews: Findings from Two Experiments," *Proceedings of the Section on Survey Research Methods*, American Statistical Association.

Nancy A. Mathiowetz (1986) "Episodic Recall vs. Estimation: The Applicability of Cognitive Theory to Problems in Survey Research." Presented at Annual Meetings of the American Association of Public Opinion Research.

Nancy A. Mathiowetz (1985) "The Problem of Omissions and Telescoping Error: New Evidence from a Study of Unemployment." *Proceedings of the Section on Survey Research Methods*, American Statistical Association.

Nancy A. Mathiowetz, Doris Northrup, and Sandra Sperry (1985) "An Evaluation of Mode of Initial Contact for In-Person Interviews." Presented at Annual Meetings of the American Association of Public Opinion Research.

Nancy A. Mathiowetz and Greg J. Duncan (1984) "Temporal Patterns of Response Error in Retrospective Reports of Unemployment and Occupation," *Proceedings of the Section on Survey Research Methods*, American Statistical Association.

Nancy A. Mathiowetz and Charles F. Cannell (1980) "Coding Interviewer Behavior as a Method of Evaluating Performance," *Proceedings of the Section on Survey Research Methods*, American Statistical Association.

Robert M. Groves, Lou J. Magilavy, and Nancy A. Mathiowetz (1980) "The Process of Interviewer Variability: Evidence from Telephone Surveys," *Proceedings of the Section on Survey Research Methods*, American Statistical Association.

Robert M. Groves, Marianne Berry, and Nancy A. Mathiowetz (1980) "Some Impacts of Computer Assisted Telephone Interviewing on Survey Methods," *Proceedings of the Section on Survey Research Methods,* American Statistical Association.

RESEARCH REPORTS

Nancy A. Mathiowetz, Kristen Olson, and Courtney Kennedy (2011) "Redesign Options for the Consumer Expenditure Survey." Prepared for the National Academy of Sciences (DBASSE-004950-0001-031411).

Nancy A. Mathiowetz (2010) "Self and Proxy Reporting in the Consumer Expenditure Survey Program." Paper prepared for the Consumer Expenditure Methods Workshop, Bureau of Labor Statistics.

Nancy A. Mathiowetz (1998) "The Impact of Biannual Interviewing on Nonresponse and Measurement Error." Paper commissioned by the National Longitudinal Study Technical Review Committee.

Nancy A. Mathiowetz. (1994) "Autobiographical Memory and the Validity of Survey Data: Implications for the Design of the Panel Study of Income Dynamics." Paper commissioned by the Panel Study of Income Dynamics Technical Advisory Board.

Nancy A. Mathiowetz, Mick P. Couper, and Eleanor Singer (1994) "Where does all the Mail Go? Mail Receipt and Handling in U.S. Households." Survey Methodology Program Working Paper No. 25. Ann Arbor: University of Michigan.

John F. Moeller, Nancy A. Mathiowetz, and Steven B. Cohen (1989) *Prescription Drugs: Use and Expenditures by Medicare Beneficiaries,* Report to Congress.

John F. Moeller and Nancy A. Mathiowetz (1989) *Prescribed Medicines: A Summary of Use and Expenditures by Medicare Beneficiaries,* National Medical Expenditure Survey Research Findings 3, Rockville, MD.

A. Vinokur, C. Cannell, S. Eraker, F. Juster, and N. Mathiowetz (1983) *The Role of Survey Research in the Assessment of Health and Quality of Life Outcomes of Pharmaceutical Interventions.* Monograph prepared for the Pharmaceutical Manufacturers Association.

EDITORIAL ACTIVITIES

Associate Principal Investigator, Time-Sharing Experiments for the Social Sciences (TESS), 2012–
Editor, *Public Opinion Quarterly,* 2008-2012
Associate Editor, *Public Opinion Quarterly,* 2004 -2007
Associate Editor, *Journal of Official Statistics*, 1998-2004
Reviewer, John Wiley Series in Survey Methodology
Reviewer, *Journal of the American Statistical Association*
Reviewer, *Survey Methodology*
Reviewer, *Journals of Gerontology*
Reviewer, *Reference Manual on Scientific Evidence*, Federal Judicial Center

TEACHING
  Courses
Methods of Research and Analysis for Urban Social Institutions (Soc 982)
Advanced Statistical Methods in Sociology (Soc 760)
Fundamentals in Survey Methodology (Soc 752)
Questionnaire Design (Soc 754)
Research Methods in Sociology (Soc 362) Data
Collection Methods in Survey Research
Survey Management
Survey Practicum

  Invited Lectures, Short Courses and Workshops
Questionnaire Design, University of Wisconsin Executive Education, 2004
Methodological Issues in the Measurement of Disability, United Nations, November, 2000
Survey Design for Response Quality in Household Surveys, 2000, Invited two-day workshop, Statistics Sweden, 2000
Survey Management, 1999, one-day short course, Department of Agriculture
Survey Management, 1998, one-week course, Summer Institute in Survey Research Techniques, Institute for Social Research, University of Michigan
Survey Management, 1998, two-day short course, JPSM Short Course
An Introduction to Pretesting, two-day short course, 1997, JPSM Short Course
Invited Lecture, Dartmouth College, 1997
Telephone Survey Design, one-week course, Summer Institute in Survey Research Techniques, Institute for Social Research, University of Michigan
Invited Scholar, Iowa State University, 1996
Questionnaire Design, 1995, half-day course, American Association of Public Opinion Research

Graduate Student Advising

Mark Caldwell, Ph.D. Dissertation Committee, 2014-2015
Marcella Blom-Willis, MA Chair, 2014-2015
Elisabeth Callahan, MA Chair, 2014-2015
Lee Chang, MA Chair, 2013-2014
Erica Svojse, MA Chair, 2013-2014
Kate Brown, MA Member, 2013-2014
Rachel Custasis, MA Chair, 2012- 2013
Brendan Held, MA Chair, 2012-2013
Ben Gilbertson, MA Member, 2012- 2013
Kara Ritchardt, MA Member 2012- 2013
Maureen Pylman, Ph.D. Prelim Chair, 2012-2013
Brienne Schreiber, Sociology, MA, Chair, 2011-2012
Atiera Coleman, Sociology, MA, Member, 2011-2012
Crystal Mathes, Sociology, MA, Member, 2011-2012
Jackie Austin, Sociology, MA, Chair, 2010-2011
Liz Grimm, Human Movement Sciences, Ph.D., 2010-2011
Matt Wagner, Urban Studies Program, Ph.D., 2008
Kirsten Brown, Sociology, MA, Chair, 2007-2008
Peter Barwis, Sociology, MA, Member, 2006-2007
Heather Price, Sociology, MA, Member, 2006-2007
Georgiann Davis, Sociology, MA, Chair, 2005-2006
Leslie Mason, Sociology, MA, Chair, 2005-2007
Kyle Poppie, Sociology, MA, Member, 2006-2007
Molly Simmerman, Sociology, MA, Chair, 2006-2007
Adam Lippert, Sociology, MA, Member, 2006
Julie Weeks, Sociology, Ph.D. Committee, 1999-2000
Jill Walston, Education Measurement and Statistics, Ph.D. Committee, 1999-2000

PROFESSIONAL ACTIVITIES

American Association for Public Opinion Research
Recipient, AAPOR Award for Exceptionally Distinguished Achievement, 2015
Past President, 2008-2009
President, 2007-2008
President-elect/Vice President, 2006-2007
Chair, Standards Committee, 2005-2006
Associate Chair, Standards Committee, 2004-2005
Secretary-Treasurer, 1995-1996
Chair, Education Committee, 1995-2001
Associate Secretary-Treasurer, 1994-1995
Membership Chair, 1990-1991
Associate Membership Chair, 1989-1990

American Statistical Association
Elected Fellow, American Statistical Association, 2012
Member, Survey Review Committee, 2001-2003
Member, Census Advisory Committee, 2000-2002
Member, Committee on Statistics and Disability, 2000-2006
Member, Committee on Meetings, 1997-2001
Member, E.C. Bryant Scholarship Committee, 1997-2003
Program Chair, Section on Survey Research Methods, 1995-1996
Program Chair-Elect, Section on Survey Research Methods, 1994-1995
Member, Continuing Education Committee, 1988-1990
Chair, Continuing Education Winter Conference, 1988-1989
Member, Survey Research Methods Technical Advisory Committee on SIPP, 1986-
1990

Advisory Committees

American Statistical Association Committee on Energy Statistics, 2010- 2015

Bureau of Labor Statistics, Consumer Expenditure Survey Expert Panel, 2010

California Health Interview Survey Technical Advisory Committee, 2009-

National Center for Health Statistics, Board of Scientific Counselors, Long Term Care Program Review Panel, 2009

National Academy of Science, Committee on National Statistics, Panel to Review U.S. Department of Agriculture's Measurement of Food Insecurity and Hunger, 2004-2005

National Advisory Board, Institute for Research on Poverty, University of Wisconsin, Wisconsin Works Child Support Demonstration, 1998-2001

National Gambling Commission, Technical Advisory Panel, 1998

National Longitudinal Survey of Children and Families in the Child Welfare System, Technical Advisory Panel, 1998-2000

Substance Abuse and Mental Health Services Administration, Technical Advisory Committee, 1997

National Longitudinal Surveys Technical Review Committee, Bureau of Labor Statistics, 1993-1999

Bureau of Labor Statistics, Invited Panel Member, Questionnaire Design Advisory Conference for the Consumer Expenditure Survey and Current Population Survey, 1987

Grants Review

National Institutes of Health, Biostatistical Methods and Research Design Study Section, Member, 2003-2007 and various special emphasis panels, 2008-

Russell Sage Foundation, 2000

National Science Foundation, 1998-

National Institute of Health, Reviewer, Mental Health AIDS and Immunology Review Committee, 1996

Reports Review

National Academy of Science, Reviewer, *Conducting Biosocial Surveys*, 2010

U.S. Department of Agriculture, Reviewer, *Continuing Survey of Food Intake*, 1996

National Academy of Sciences, Reviewer, *Report on Survey of Scientists and Engineers*, 1991

Miscellaneous

Organizer, Interviewer-Respondent Interaction Workshop, Boston, MA May, 2013
Chair, Charles Cannell Fund in Survey Methodology, 2003-
Federal Committee on Statistical Methodology, Member, Subcommittee on
Statistical Training, 1995-1999
Social Science Research Council, Invited Participant, Workshop on the Cognition and
    Measurement of Pain, 1987
Social Science Research Council, Invited Participant, Seminar on Effect of Theory-
    Based Schemas on Retrospective Data, 1987

University of Wisconsin-Milwaukee

Faculty Chair, Zilber School of Public Health, 2014-2015
Chair, School of Public Health Founding Dean Search Committee, 2010-2011
Member, School of Public Health Executive Committee, 2010-2011
Chair, Merit Committee, Sociology Department, 2010-2013
Member, School of Public Health Planning Council, 2007- 2009
Member, Division of Social Sciences Executive Committee, 2005-2008
Official Representative to the Inter-University Consortium for Political and Social
Research, 2003-2007
Chair, Recruitment Committee, Department of Sociology, 2005; 2012
Chair, Curriculum Committee, Urban Studies Program, 2004-2005; 2010-2012
Member, Research Committee, Center for Age and Community, 2003-2005
Member, Applied Gerontology Certificate Committee, 2004-2006
Member, Executive Committee, Urban Studies Program, 2005
Member, Graduate Committee, Sociology Department, 2005-2009; 2012-2015

JOINT SPORTS CLAIMANTS' REDACTION LOG FOR WRITTEN REBUTTAL TESTIMONY

In re Distribution of Satellite Royalty Funds, No. 14-CRB-0011-SD (2010-13)

Document	Page Number(s)	Basis For Redaction	Description of Redacted Information
Written Rebuttal Testimony of Andrew Dick, Ph.D.	28-31	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence.	Network affiliate fees data for 2010-13.
Written Rebuttal Testimony of James M. Trautman	7-8 (Figure 2)	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence.	Data on license fees and average 24-hour ratings for certain networks in 2010-13.
Written Rebuttal Testimony of James M. Trautman	9 (Figure 3)	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence.	Data on license fees and average prime time ratings for certain networks in 2010-13.
Written Rebuttal Testimony of James M. Trautman	11 (Figure 4)	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence	Data on license fees and average 24-hour ratings for sports and non-sports networks in 2010-13.
Written Rebuttal Testimony of James M. Trautman	14 (Table 2)	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence	Data on average 24-hour ratings and prime time ratings for certain networks in 2010-13.

Document	Page Number(s)	Basis For Redaction	Description of Redacted Information
Written Rebuttal Testimony of James M. Trautman	15	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence.	Data on license fees for certain networks in 2010-13.
Written Rebuttal Testimony of James M. Trautman	17 (Figure 5)	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence.	Data on average monthly revenue per subscriber for certain networks in 2010-13.
Written Rebuttal Testimony of James M. Trautman	A3-A8, (Tables A-2, A-3, A-4, A-5)	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence.	Data on license fee per prime time and 24-hour ratings for certain networks in 2010-13.
Written Rebuttal Testimony of James M. Trautman	Appendix B	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence.	Data on average license fee per subscriber for certain networks in 2010-13.
Written Rebuttal Testimony of Daniel Hartman	8-9, 12	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence.	Data on average license fee per subscriber for certain networks in 2010-13.
Written Rebuttal Testimony of David Shull	5-6, 11	Contains confidential, proprietary data reported by Kagan, a media research group within S&P Global Market Intelligence.	Data on network affiliate fees in 2010-13.

Document	Page Number(s)	Basis For Redaction	Description of Redacted Information
Written Rebuttal Testimony of William Wecker, Ph.D. and R. Garrison Harvey	6, 7, 16, 18-20, 41, 42, 44-45	Contains data that Program Suppliers designated as RESTRICTED	Household distant viewing estimates calculated by Program Suppliers witnesses Paul Lindstrom and Dr. Jeffrey Gray and Gracenote broadcast programming data.
Written Rebuttal Testimony of Brad Adgate	6-7	Contains material that Program Suppliers designated as RESTRICTED	Data from the 2012-13 Nielsen National Reference Supplement
JSC Exhibit 21, Testimony of James Trautman, Docket No. 14-CRB-0010-CD (2010-13) (Oct. 5, 2017)	A-2	Contains material designated as RESTRICTED in the 2010-13 Cable Proceeding	CDC data on unique distant subscribers by signal type of 2010-13.
JSC Exhibit 21, Testimony of James Trautman, Docket No. 14-CRB-0010-CD (2010-13) (Oct. 5, 2017)	B-2 to B-4	Contains material that Program Suppliers designated as RESTRICTED in the 2010-13 Cable Proceeding	Excerpted Gray/Gracenote data on WGNA compensable programs and categorization
JSC Exhibit 21, Testimony of James Trautman, Docket No. 14-CRB-0010-CD (2010-13) (Oct. 5, 2017)	C-2 to C-5	Contains material that Program Suppliers designated as RESTRICTED in the 2010-13 Cable Proceeding	Excerpts of documents containing CDC carriage data
JSC Exhibit 25, William E. Wecker, Associates, Inc. Analysis of Written Direct Testimony of Jeffrey S. Gray, Ph.D.	13-15	Contains material that Program Suppliers designated as RESTRICTED in the 2010-13 Cable Proceeding	Lindstrom/Nielsen NPM data.

Document	Page Number(s)	Basis For Redaction	Description of Redacted Information
JSC Exhibit 25, William E. Wecker, Associates, Inc. Analysis of Written Direct Testimony of Jeffrey S. Gray, Ph.D.	15-16	Contains material designated as RESTRICTED in the 2010-13 Cable Proceeding	Nielsen NPM data on distant viewing of compensable programming on WGNA
JSC Exhibit 25, William E. Wecker, Associates, Inc. Analysis of Written Direct Testimony of Jeffrey S. Gray, Ph.D.	25-26	Contains material that Program Suppliers designated as RESTRICTED in the 2010-13 Cable Proceeding	Lindstrom/Nielsen NPM data.
JSC Exhibit 25, William E. Wecker, Associates, Inc. Analysis of Written Direct Testimony of Jeffrey S. Gray, Ph.D.	C-1	Contains material that Program Suppliers designated as RESTRICTED in the 2010-13 Cable Proceeding	Lindstrom/Nielsen NPM data.
JSC Exhibit 25, William E. Wecker, Associates, Inc. Analysis of Written Direct Testimony of Jeffrey S. Gray, Ph.D.	G-1 to G-104	Contains material designated as RESTRICTED in the 2010-13 Cable Proceeding	Nielsen NPM data on distant viewing of compensable programming on WGNA
Oral Testimony of Dr. Jeffrey Gray, Docket No. 14-CRB-0010 (2010-13) (March 14-15, 2018)	3901:1-3925:14	Transcript of testimony during closed session of the Copyright Royalty Board	Discussion of Lindstrom/Nielsen NPM data.
Oral testimony of Dr. Mark Israel, Docket No. 14-CRB-0010 (2010-13) (March 12, 2018)	2916:1-2933:13	Transcript of testimony during closed session of the Copyright Royalty Board	Testimony describing data underlying the Bortz Survey

Document	Page Number(s)	Basis For Redaction	Description of Redacted Information
Oral Testimony of Daniel Hartman, Docket No. 14-CRB-0010 (2010-13) (March 12-13, 2018)	3204:9-24; 3245:24-3247:18	Contains testimony that Settling Devotional Claimants designated as RESTRICTED	Testimony regarding former colleague
Oral Testimony of R. Garrison Harvey, Docket No. 14-CRB-0010 (2010-13) (February 22, 2018)	1168:23-1177:19; 1189:1-1197:6	Transcript of testimony during closed session of the Copyright Royalty Board	Discussion of Lindstrom/Nielsen NPM data.

Proof of Delivery

I hereby certify that on Monday, August 26, 2019, I provided a true and correct copy of the Written Rebuttal Statement of the Joints Sports Claimants Vol. I-III PUBLIC VERSION to the following:

National Public Radio, Inc. (NPR) (submitted comment), represented by Gregory A Lewis, served via Electronic Service at glewis@npr.org

American Society of Composers, Authors and Publishers (ASCAP) and Broadcast Music, Inc. (BMI), represented by Brian Coleman, served via Email

Broadcaster Claimants Group, represented by Ann Mace, served via Electronic Service at amace@crowell.com

Devotional Claimants, represented by Clifford M Harrington, served via Electronic Service at clifford.harrington@pillsburylaw.com

Major League Soccer, LLC, represented by Edward S. Hammerman, served via Electronic Service at ted@copyrightroyalties.com

Settling Devotional Claimants, represented by Jessica T Nyman, served via Electronic Service at jessica.nyman@pillsburylaw.com

American Society of Composers, Authors and Publishers (ASCAP), represented by Sam Mosenkis, served via Electronic Service at smosenkis@yahoo.com

Spanish Language Producers, represented by Brian D Boydston, served via Electronic Service at brianb@ix.netcom.com

Motion Picture Association of America (MPAA)-Represented Program Suppliers, represented by Gregory Olaniran, served via Email

SESAC, Inc., represented by John C. Beiter, served via Electronic Service at jbeiter@lsglegal.com

Broadcast Music, Inc. (BMI), represented by Jennifer T. Criss, served via Electronic Service at jennifer.criss@dbr.com

Multigroup Claimants, represented by Brian D Boydston, served via Electronic Service at brianb@ix.netcom.com

MPAA-represented Program Suppliers, represented by Gregory O Olaniran, served via Electronic Service at goo@msk.com

Signed: /s/ Michael E Kientzle